12-2020

Missing in Action: Locating the Body in Interdisciplinary Studies

Ann Lenore Moradian
perspectivesinmotion@gmail.com

UNIVERSITY OF NORTHERN COLORADO

Greeley, Colorado

The Graduate School

MISSING IN ACTION: LOCATING THE BODY IN INTERDISCIPLINARY STUDIES

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Arts

Ann Lenore Moradian

College of Visual and Performing Arts
School of Theatre Arts and Dance
Dance Education

December 2020

This Thesis by: Ann Lenore Moradian

Entitled: *Missing in Action: Locating the Body in Interdisciplinary Studies*

has been approved as meeting the requirements for the Degree of Master of Arts in the College of Performing and Visual Arts, the School of Theatre Arts and Dance, Program of Dance Education

Accepted by the Thesis Committee:

_____

Sandra L. Minton, Ph.D., Chair, Advisor

_____

Christy O'Connell-Black, M.A., Committee Member

Accepted by the Graduate School:

_____

Jeri-Anne Lyons, Ph.D.
Dean of the Graduate School
Associate Vice President for Research

ABSTRACT

Moradian, Ann Lenore. *Missing In Action: Locating the Body in Interdisciplinary Studies.* Unpublished Master of Arts thesis, University of Northern Colorado, 2020.

This research relied on the use of interdisciplinary literature, surveys and interviews to explore the prevalence of the human body and its movement across a variety of disciplines other than movement-based practices, and also to explore perspectives of movement experts regarding the knowledge, skills, and capacities they believed might be related to their practice-based work. In other words, what do movement practitioners and movement experts know, and who cares?

Among the essential questions driving this study were:

Q1 How do other disciplines integrate, relate to, or consider the human body or its movement in their research, writing or practice?

Q2 What knowledge, skills, capabilities and strengths do movement practitioners and experts have to contribute to discussions that include the human body, its movement or its affects?

Q3 What knowledge, skills, capabilities and strengths do movement practitioners and experts have to contribute to discussions and efforts that address challenges to systemic health confronting humanity today?

Q4 Why are movement practitioners and experts often absent from interdisciplinary discussions that include the human body, its movement or its affects?

The materials gathered were analyzed with the aim of understanding the range of possibilities for future work, and identifying areas of potential discourse, engagement, or collaboration across disciplines. Because the primary aim of this research was to identify possibilities, rather than make comparisons or identify trends, the limitations to this study should be negligible. Those limitations included researcher bias, potential participant bias, the limited

reach within disciplines other than movement-based practice, and the subjective nature of a self-rating exercise in which the movement experts participated.

The outcomes of this research were founded on the responses of 89 interdisciplinary survey participants, 97 movement expert survey participants, and discussions with eleven interview participants coming from both interdisciplinary and movement-based fields. These outcomes revealed a strong interest in the body and its movement across a number of disciplines, including psychology, neuroscience and technology. Although disciplines outside of movement-based practice are involved in interdisciplinary projects that work with the body in powerful and important ways, instances where movement experts are called upon to contribute their practice- and praxis-based knowledge remain an exception rather than the norm. Even where movement experts' embodied knowledge is recognized for its depth and import, it continues to be approached largely from the outside-in, where the body remains a container, or top-down, where the intellect and linear thinking impose limitations on what is potentially a vast body of knowledge. This research revealed potential directions and synergies for future work, entrenched institutional resistance to interdisciplinary collaboration, and serious ethical questions concerning the aims of body-based knowledge and its use.

ACKNOWLEDGEMENTS

The work involved in realizing this thesis project is dedicated to the community of diligent, rigorous, courageous, honest, and often deeply wise human beings who demonstrate every day their commitment to living and learning through the wholeness of being a body. To me, this is the foundation of our empathy and our humanity, and where I believe hope for the future lies. I would like to thank all of the participants and each of those interviewed for their time, expertise, interest, and generosity in helping me to better understand this complex material.

I would like to acknowledge those who have given me the courage and skills needed to wander through the unknown terrains of life and creative practice with a sense of vital engagement, confidence, and delight. This list includes first and foremost my mother, Marty Tharp, and Jim May, who I consider a mentor in the world of creative practice. I would also like to thank Janet Culp, child psychologist and pioneer in the wilderness of mind. She understood where I was headed long before I did, and helped me find the strength to proceed.

I would like to thank my advisor, Dr. Sandra Minton, and Professor Christy O'Connell-Black for providing me with the freedom to explore outside-of-the-box, as well as the structure and guidance needed to frame and contain this research. I'd also like to thank Professor Rima Faber for her support and assistance with this project.

I would like to acknowledge the many teachers who have each gifted me with skills and qualities needed for living a life well, and whose teachings will be reflected in all that I do. These include (in chronological order) Mattie Springfield, Maxine Williamson, Finis Jhung, Eric Beeler, Nadia Creamer, Milton Myers, Laurin Raiken, Philippe Nguyen, Lucien Forni, Catherine Auffret, Ellie Edelhoff, Fritjof Capra, and Jérôme Yelnik, among many others.

I would like to thank Nannette Bertschy, Camila Amaya Castro, Patricia Danahey, Jeffrey Friedman, Pauline Gasquet, Nerida Godfrey, Jeffrey Gormley, Marie-Odile Habert, Rania James, Breegan Kearney, Leonie Koban, Sabine Meunier, Lara Migliaccio, Corinne Ott, Hiie Sauma, Dilafruz Williams, and Claire Wyart for their beautiful minds, their generosity, and support, with a special nod of gratitude to Corinne and Pat who have accompanied me so graciously on this particular journey.

I would like to express my deep gratitude to my husband, Khodu Moradian, and our son Jivahn Moradian, for not only their beautiful minds, generosity, and support, but also for making life worth living, and for teaching me the deepest and most beautiful lessons in life. Without their love, support, and humor life would lack its shimmer.

And lastly, I would like to recognize in gratitude my father, Ken Tharp, for gifting me by example the inheritance of a moral compass, without which, nothing else matters.

TABLE OF CONTENTS

CHAPTER

I.	INTRODUCTION…….....	1
	Background……...	1
	Goal of Thesis……...…	5
	Purpose of Study……...	6
	Significance of Study……	8
II.	REVIEW OF LITERATURE…….……..	11
	Overview: Systemic Health and the Moving Body……..	11
	Biology……..	12
	Psychology…….....	19
	Transhumanism…….	27
III.	METHODOLOGY……..…..	35
	Research Elements……	35
	Research Participants……	36
	Research Instruments……	39
	Data Analysis……	41
IV.	DISCUSSION……..…….	43
	Interdisciplinary Surveys……..	43
	Movement Expert Surveys……	53
	Interviews…….	66
V.	CONCLUSION……...…..	86
	Methodology Review……	86
	Summary of the Outcomes……	87
	Discussion…….	101
	Conclusion…….....	107
WORKS CITED…….……...….		110

APPENDICES……...… 116

A. INSTITUTIONAL REVUE BOARD APPROVAL LETTER AND DOCUMENTATION, CONSENT FORMS, AND PROJECT DESCRIPTION……... 116

B. RESEARCH INSTRUMENTS……..... 124

C. DETAILED DESCRIPTION OF INTERDISCIPLINARY PARTICIPANTS' FIELDS OF WORK…… 159

D. BODY SCHEMA IMAGE AND EXAMPLES OF PARTICIPANTS' RESPONSES..... 161

E. BODY-MIND-ENVIRONMENT SCHEMA, NINE ORIGINAL OPTIONS..... 167

F. MOVEMENT EXPERT PARTICIPANTS' SELF-RATING OF SKILLS, ABILITIES AND CAPACITIES…… 169

G. MOVEMENT EXPERT PARTICIPANTS' COMPARISON OF TOP-RATED SKILLS AND ABILITIES……. 174

LIST OF FIGURES

FIGURE 1.	The Triune Brain……...	15
FIGURE 2.	Lineages of Influence in Somatics……...	26
FIGURE 3.	Disciplines practiced by the movement experts……	39
FIGURE 4.	How interdisciplinary participants learned about the human body……..	44
FIGURE 5.	Body-Mind-Environment Schema, top three choices of interdisciplinary participants……	53
FIGURE 6.	Orientation of disciplines related to this study…….	87

LIST OF TABLES

TABLE 1.	Psychology Timeline…….	21
TABLE 2.	Interdisciplinary Participants' Level of Education…….....	37
TABLE 3.	Interdisciplinary Participants' Years of Work Experience……	37
TABLE 4.	Movement Expert Participants' Level of Education.....	38
TABLE 5.	Movement Expert Participants' Years of Work Experience…….	38
TABLE 6.	When Interdisciplinary Participants Were Most Aware of Their Bodies……	50
TABLE 7.	Where Interdisciplinary Participants Felt Their Mind Resides.....	52
TABLE 8.	Enhanced Awareness Most Important in Movement Experts' Daily Lives……	55
TABLE 9.	Personal Skills, Capacities and Qualities Most Significant in Movement Experts' Daily Lives……	56
TABLE 10.	Interpersonal Skills and Abilities Most Useful in Movement Experts' Daily Lives.....	57
TABLE 11.	Creative Skills or Abilities Most Useful in Movement Experts' Daily Lives……	58
TABLE 12.	Organizational Skills and Abilities Most Useful in Movement Experts' Daily Lives.....	59
TABLE 13.	Movement and Physical Skills Most Useful in Movement Experts' Daily Lives ……	60
TABLE 14.	Where Movement Expert Participants Felt Their Mind Resides….	62
TABLE 15.	Comparison of Top Three Selections of Body-Mind-Environment Relationship……....	63

CHAPTER I

INTRODUCTION

This thesis project explored the prevalence of the human body and information related to the living human body and its movement, as it exists across diverse disciplines, particularly disciplines other than dance or athletics. This study also attempted to offer a preliminary report on the values and benefits of movement-based practice as perceived by movement experts. The research for this thesis was based upon published materials, surveys, and interviews, and was informed by the embodied praxis of the researcher over a long career as a movement practitioner, artist, and educator. The first chapter of this thesis presents the background, goals, driving questions, and significance of this study.

Background

Attitudes toward the body are in the process of shifting dramatically today. For over 2000 years, western culture has rejected, even despised, the human body, resulting in what has often been referred to as the Cartesian mind-body split. Anne Baring and Jules Cashford traced this separation of mind and body to the late Bronze and early Iron Age (approximately 1200 BCE), when a distinction between the permanent and impermanent was first made (151-152; Eddy and Moradian 4). Plato's devaluation of material existence in Greece during the 4th century BCE was embedded and amplified in later Christian thought, which considered the body filthy, bestial, and sinful (Lent, disc 6). These ideas are foundational to western attitudes toward body and nature both. By the mid-17th century, Italian physicist, astronomer, and engineer Galileo Galilei shifted human perspective with his use of the telescope to that which could be objectively measured and

quantified (Capra "Web" 9), while French mathematician, scientist and philosopher René Descartes unequivocally defined mind as separate from body (Lent, disc 6; Capra "Web" 19-20), effectively banishing body from the scene.

Hannah Arendt, in 1957, identified the deep disillusionment with the earth, nature, and human mortality as a significant motivator propelling scientific efforts in the development of space travel, as well as artificial life, which she said would effectively sever any remaining connection between humans and nature. After the creation of atomic weapons and the launch of the first successful satellite, human predictions for creating artificial life by the middle of the 21st century were not doubted, nor was the then-present "…ability to destroy all organic life on earth" questioned. The only question was "…whether we wish to use our new scientific and technical knowledge in this direction" (2). Arendt strongly believed that "…this question cannot be decided by scientific means; it is a political question of the first order and therefore can hardly be left to the decision of professional scientists or professional politicians" (2) Updating this thought to account for current circumstances and power structures, one could add: neither should it be a decision for professional business tycoons or billionaires. Ever prescient, Arendt added:

> If it should turn out to be true that knowledge (in the modern sense of know-how) and thought have parted company for good, then we would indeed become the helpless slaves, not so much of our machines as of our know-how, thoughtless creatures at the mercy of every gadget which is technically possible, no matter how murderous it is. (3)

More recent developments in science and mathematics since that time have, however, allowed for, and in the case of science even demanded, a reconsideration of this estranged relationship between body and mind, humankind and nature. Even with breakthroughs in neuroscience – specifically scientific evidence produced in 1964 by Marian Diamond at the University of California at Berkeley revealing the brain's neuroplasticity, its capacity to change synaptic organization (Diamond) – the study of cognition, mind, and emotion were strongly

discouraged as domains for scientific inquiry up until the 1970s, when complexity theory was developed. Complexity theory uses the high-powered capacity of computers to map complex, nonlinear relationships mathematically (Capra and Luisi 11-12). Also known as nonlinear mathematics, this development provided the foundation for today's booming research in cognitive neuroscience, the mind, and emotions, among others.

The concept of *autopoiesis*, developed in Chile in the 1970s by biologist and philosopher Humberto Maturana and biologist and neuroscientist Francisco Varela, proposed that all living organisms are self-making and, therefore, cognitive beings or "… intelligent cellular systems acting autonomously in creating a world" (Batson and Wilson 77). Often referred to as the Santiago Theory of Cognition, this idea suggested that cognition was an emergent property arising from the "…dynamic sensorimotor coupling between organism and environment" and was not limited to humans. Varela's ongoing theories in embodied cognition "…helped shift the cognitive paradigm from a computational theory of cognition toward an experiential one" (Batson and Wilson 77), valorizing not only experience but also, the body and environment in and through which experience arises.

Other developments reuniting mind and body arose and were documented in 1993 by Bill Moyers in a series of interviews called *Healing and the Mind.* Moyers gathered together many of the then-current pioneers in medical research, and included cutting edge developments in Chinese medicine, biofeedback, the connection between emotions and the immune system, and meditation in this series. It also included the work of Jon Kabat-Zinn, whose research in Mindfulness Based Stress Reduction was later validated by numerous randomized control trials, and is now accepted into hospitals, businesses and schools worldwide. Today, the new field of integrative medicine incorporates these and other 'alternative healing' practices which consider

the mind and body as a unified whole. In validating these holistic approaches to healing, the field of medicine also began to draw these practices toward the mainstream (https://www.nccih.nih.gov).

By 1994, the research of neuroscientist Antonio Damasio suggested that consciousness and rationality are not only associated with, but also dependent upon the body, its sensations, and the emotions experienced through it (Craig). In his 1996 article "The Somatic Marker Hypothesis and the Possible Functions of the Pre-frontal Cortex," Damasio articulated his theory, offering a persuasive scientific basis that the mind and body are inextricably interwoven (Damasio). His work has been largely accepted, and today, studies related to embodiment, the living body, its movement and processes are now perceived as not only valid, but even critical topics for research.

In spite of these developments, 'old habits die hard;' discomfort with and disassociation from the body remain problematic in the western industrial world (Brown; Stromsted; Eddy and Moradian 6-7; Moradian 16). Epidemic levels of depression, stress, anxiety and post-traumatic stress disorder (PTSD), among others (Brown), attest to a great unease that continues to disrupt the smooth and healthy functioning of mind, body, and being. It is remarkable that even experienced movement practitioners who engage in regular and ongoing 'conversation' with their bodies through movement can keep the depths of the body at bay with mind-over-matter approaches that bypass much of the rich and subtle information the body holds. At the same time, both ancient and contemporary practices and practitioners have, and continue to engage with the body in numerous and profound ways that bring awareness to the processes of living that are within us (Eddy 5).

Goal of Thesis

This study aimed to assess, in broad and general terms, which disciplines not traditionally engaged in movement as praxis are currently engaged in body-related studies, and in what ways they consider, interact with, and study the human body and its movement. The primary goal was to help facilitate interdisciplinary discussion, cooperation, research, and partnerships concerning the human body and being. Becoming familiar with the terminology used for body-related concepts across different disciplines was intended to aid in identification and comprehension of key research in this vast field of interdisciplinary study. The expectation was that identifying common areas of interest, gaps and potential synergies in the field of body-related research might help to facilitate dialogue, inspire further research, and help to avoid redundant or wasted efforts within and between fields. It is important to note that, while interdisciplinary cooperation is clearly needed and called for, this does not in any way diminish the importance or the value of the work being done in diverse areas of specialization pertaining to human movement, the human experience, and the living body. Both approaches are necessary and called for.

In addition to exploring body-related studies across disciplines, this research surveyed movement-based practitioners to identify some of the knowledge, skills, and abilities they felt came from or were related to their practice. In addition to offering movement experts a moment to reflect on implicit, and perhaps also unconscious, knowledge and capacities, it was hoped that this exercise might offer an opportunity to put language, and with it, conscious awareness, to what could be seen as largely immersive, experiential research in embodied knowledge. Without awareness of, and language for this body of knowledge, meaningful communication with other fields remains near impossible. The body has become central to some of the most critical discussions of our times, yet too much discourse concerning the body focuses on what is known

about the body, while disregarding what is known *through* the body. As Maxine Sheets-Johnstone wrote, "If the body is part of our discourse, why not let it speak?" (85).

Purpose of Study

This thesis project aimed to offer a partial map, regardless of how limited or rudimentary, that might help those interested in interdisciplinary, body-related studies locate the body within and across disciplines. It was hoped that this research would provide an introductory orientation for those unfamiliar with this terrain, and advocate for interdisciplinary discourse, debate, and collaboration, as well as encourage the development of new directions for further research. Encouraging recognition of the value, relevance and potential contributions of movement practice as praxis also served as a motivator. However, the most powerful driving force behind this research was the wish to bring awareness to the critical importance of instilling healthy relations between mind, body, and world.

Some essential questions that inspired the pursuit of this study included:

Q1 How do other disciplines integrate, relate to, or consider the human body or its movement in their research, writing or practice?

Q2 What knowledge, skills, capabilities, and strengths do movement practitioners and experts have to contribute to discussions that include the human body, its movement or its affects?

Q3 What knowledge, skills, capabilities and strengths do movement practitioners and experts have to contribute to discussions and efforts that address challenges to systemic health confronting humanity today?

Q4 Why are movement practitioners and experts often absent from interdisciplinary discussions that include the human body, its movement or its affects?

Not all of these questions were fully addressed, nor were those addressed fully answered in this research. Nevertheless, these questions served to frame an inquiry that: explored the perceived value of movement-based practice beyond traditional arenas of aesthetics or athletics; probed into body-related research across disciplines today; and, considered some of the language

used in these diverse domains. It was hoped that this effort would join voice with others that recognize our experience as humans being in motion as a living laboratory that accompanies each of us throughout our lives, informing and participating in the shaping of our experience, our world, and our shared realities.

While information about, from and through the human body is being integrated into an array of fields, the aims, focus and language used vary. One premise driving this research was that there is a not-yet fully defined field of interdisciplinary research focused on or around the living human body, its movement and experience, and that this emerging field lacks a common language. Terms used in this emerging field include animation, body studies, corporeality, cultural biology, embodied cognition, embodiment, enactive cognition, the lived body, movement literacy, somatics, and 4E, 7E, or 4EA cognition, among others. The term human ecology is noteworthy as well, although it does not appear to include body studies in any significant or direct way as yet, and would be more appropriate in the plural, human ecologies.

While there are many challenges to any interdisciplinary project, surely the lack of a common language contributes to the paucity of discourse across disciplines. This lack of communication perpetuates the difficulty in identifying relevant material, duplicated efforts, and isolated studies or pockets of activity. This means that efforts made have far less relevance or impact than they might have if they were able to reach more of those who are interested in them. In an attempt to open this discussion across disciplines, and for the purposes of this thesis, the term *body studies* was used in the hope that it would serve to include multiple disciplines, and allow space for continued input, as this emerging field states its claims and begins to define its parameters.

Significance of Study

The human species today is confronted with a series of systemic breakdowns challenging human, social and planetary health, while human behavior continues to elude comprehension. "The basic elements of life on earth that we take for granted… are rapidly being consumed by humanity's voracious demands" (Lent disc 14). Our institutions, and our ways of living together, perpetuate a violence against one-another, and against life itself that can no longer be ignored or tolerated. While we can extract a singular memory from the brain of a mouse, grow a cow's ear on its tiny head, and engineer the world around and inside us, there is a prevailing sense that our ability to manipulate our world is "…outpacing our capacity for making wise and far-sighted use…" of our skills (Harari 450).

As the human species faces the challenges and ramifications of human activity and its devastating effects on the earth and in our world, we are faced with the understanding that this activity is driven by human behavior – by *our* behavior, individually and collectively. Neuroscience today confirms that human behavior issues less from rational thought than from emotions (Sapolsky 25). Current findings in the field of embodied cognition argue that emotions are connected to the body and its sensory, motor and nervous systems (Damasio "Feeling" 294), while scientists, phenomenologists, philosophers, and an occasional movement specialist, debate between the 4Es, 4EAs, and 7Es that they suggest define experience as 1) embodied, 2) embedded, 3) enactive, 4) extended, 5) enmeshed, 6) emergent, 7) empathic, and the 'A' standing for affective (Batson and Wilson 78). It is understood, at least in some spaces, that the processes which bring consciousness into being flow reciprocally, rather than uni-directionally, and that body, mind, and world are coupled, forming a living, complex and interdependent system that brings forth a co-evolving world (Maturana).

Developments in science and other areas of academic research have begun to efface the effects of the Cartesian mind-body split, situating humankind firmly within the natural world of the living, with mind and body, humankind and nature rejoined. The old paradigm, which has framed and influenced human attitudes and behavior in the western industrial world for millennia and includes this devaluation of the body, is shifting at a rapid pace. There is an understanding that the living body can no longer be forgotten or ignored. After centuries of being treated with mistrust, disgust, fear, disdain and disregard, the prodigal body appears to be situated today at the heart of the matter.

There are numerous approaches to the study of movement, embodiment, and the lived and living body, and many ways to apply this knowledge. A number of disciplines have been conducting important and fascinating research, alone and with other fields. "Two decades of exchange [between dance and science] have sown the seeds of new research that is both applied (praxis-based) and praxis-*driven*" (Batson and Wilson 17). All of this research brings valuable perspectives that have the potential to offer solutions or shed light on the challenges humanity faces today (Lent; Harari; Ward). The body is central to many of the most important debates and inquiries of our times, whether we know it or not, and this includes current discussions on participatory and conscious evolution of humankind as a species.

While continuing to make headway in specialized research pertaining to the living body is necessary, having a common space for exchange and collaboration is also critical. Avoiding wasted or redundant efforts is among the most obvious arguments for such interdisciplinary discourse, but opportunities to identify potential partnerships, explore synergies, and develop new areas of research would also be worthwhile. The interplay of body, mind, and world that corresponds with human experience and consciousness includes logic and rational thought,

certainly, but it is not limited to them. The researcher hoped that exploring the current state of body studies across disciplines, even only in this present rudimentary manner, would offer one small step toward recognizing the possibilities opened through this subject, and advocating on its behalf.

CHAPTER II

REVIEW OF LITERATURE

In attempting to identify different disciplines concerned and engaged with the body, the areas that surfaced most prominently and engagingly with the researcher's interests were biology, psychology, and conversations in technology related to the topic of transhumanism. The edges of these fields are permeable, and isolating any single field or discipline was increasingly difficult. The body refuses to be tamed by language, or respect the boundaries words attempt to impose. Both neuroscience and evolutionary studies proved to be integrally entwined with biology and psychology. Ecology, not surprisingly, demonstrated strong affiliations with biology. Phenomenology and philosophy had much to say concerning cognition, which was grouped in this paper under the broader topic of psychology. In addition to writings in these disciplines, the work of Jeremy Lent, Yuval Noah Harari, Hannah Arendt, and Fritjof Capra helped to frame this research, while the work of Gregory Bateson, Bessel van der Kolk, Maxine Sheets-Johnstone, Glenna Batson, and Jeffrey Gormley have informed it.

Overview: Systemic Health and the Moving Body

Whether concerned with human health and wellbeing, socio-cultural interactions and the health of nations, or the health of the biosphere and the ability of the earth to support life – specifically, but not exclusively, *human* life – these different scales of, what this researcher refers to as, systemic health are all concerned with humans as living organisms, and their interactions with and in these multi-scaled 'ecologies.' The underlying concern driving this research was not simply the human body or movement in its physical manifestations and

relationships, but more specifically, an interest in the human embodied being as a living creature in dynamic and affective relation with itself, the other, and more-than-other. This inquiry considered human movement, initiating from the perspective of the dancer and choreographer, and extending this gaze beyond the customary frame of dance, contextualizing the questions of how we move, are moved, and move in relation to and within the dynamic framework of our living, and our becoming. In essence, this research explored the living, participatory and creative act of full-bodied being in our shared world or, metaphorically speaking, how we dance not just *with* life, but how we dance life.

Biology

Biology is the foundational science concerned with life, death, and transformation in living organisms. It spans from the study of the most basic living system at the level of the cell, to chemical processes, genetics, evolution, and more recently, neurobiology. In this area the thesis relied on the research of neurobiologist Robert Sapolsky and biologist Humberto Maturana. Different bodies of Maturana's work were developed in collaboration with Francisco Varela, Gerda Verden-Zöller, and Ximena Davila. The work of cybernetics scientist James Lovelock, microbiologist Lynn Margulis, along with geo- and astro-biologist Peter Ward have also informed the biological and ecological understandings of this research.

Background and Driving Questions

Margulis was an important pioneer in microbiology who identified symbiosis as the primary vehicle for evolution at the cellular level. Her discoveries at this microscopic level provided the biological groundwork needed for Lovelock's Gaia Theory, which she helped him develop in the 1970s. The Gaia Theory proposed that, seen from the planetary level, the earth is a complex system of living organisms engaged in interactions with their non-living environs in a

dynamic balance of complex, self-regulating synergies that support and maintain conditions for life. For anyone interested, Margulis' pragmatism left no room for confusion: the earth is not an organism, nor is it alive. It is an ecosystem (Feldman).

In the previous discussion noting some of the challenges confronting humanity today, at the planetary level it is this dynamic balance of the biosphere that human activity has thrown out of kilter. While living organisms can and do use feedback to modify behavior for self-regulation that supports and maintains conditions for its life (as suggested by Gaia Theory), Ward challenged the Gaia Theory with what he called the Medea Hypothesis, arguing that living organisms are "…witlessly destructive…" and ultimately self-destructive, rather than self-regulating (129). It is, in large part, this debate between humankind's constructive or destructive participation in the world that captivated the researcher's imagination and interest, specifically from the perspective of a creative movement artist.

Inclusion of the Body and Movement in the Discipline

Sapolsky mined the human mind, body and social interactions in his book, *Behave: The Biology of Humans at Our Best and Worst,* for clues to understand where violence comes from and what we might do about it. Whereas cognitive psychologist Steven Pinker suggested that violence today has diminished as a result of a shift from valuing souls to valuing lives, Sapolsky believed this shift was due to "…the interaction of reasoning and feeling." The purely rational mind, he wrote, "…makes abhorrent moral judgments" (618). An important idea he wished to convey was that when behavior is explained through the lens of one discipline, such as biology, psychology, or culture, there is an implicit invocation of all the disciplines" (7). His conclusion, founded on extensive primate research, was that human violence against other humans is not a universal characteristic of our species (4).

Sapolsky's work explored the biological underpinnings of human social behavior and its complex intermingling of genes, hormones, brain chemistry, prenatal environment, early experience, sensory cues, ecological pressures, and biological and cultural evolution (5). Isolating these complex phenomena into separate categories can improve fact retention, but also "… wreak havoc on your ability to think about those facts" or to see the whole picture (6). Informed by thirty years of research on baboons in East Africa, Sapolsky looked closely at social behavior (such as competition, aggression, violence, empathy, affiliation, reconciliation and altruism) within the environment and at different timescales, from the immediate stimulus-response that triggers behavior, to the much longer span of time across generations (4-7).

Looking at how the brain functions in the second leading up to a behavior, Sapolsky organized the human brain into three simple metaphoric layers called the triune brain. Layer one correlated with the reptilian brain that controls automatic regulatory functions and behavior; layer two he identified as the mammalian brain where strong emotions reside; and layer three related to the neocortex which is associated with thought. These layers overlap, to a certain degree, and information flows bi-directionally between them (Sapolsky 22-23). Human behavior engages all three of these layers simultaneously in the form of cognition, emotion and automatic responses (24). Whereas the reptilian brain is concerned with automatic regulation of core functions like heart rate, respiration, and temperature, the limbic system found in layer two is "…central to the emotions that fuel our best and worst behaviors" (Sapolsky 25). The limbic system operates through "… complex circuits of excitation and inhibition," and is connected to the older, reptilian part of the brain by the hypothalamus, which passes information between the two regions, and manages the release of many hormones (Sapolsky 25, 27). Most sensory information passes through the cerebral cortex, or layer three, where it is processed by the

logical, analytical part of the brain. The frontal lobe of the cerebral cortex is the interface that mediates between layers two and three. These parts of the brain can either stimulate or inhibit each other (28-29).

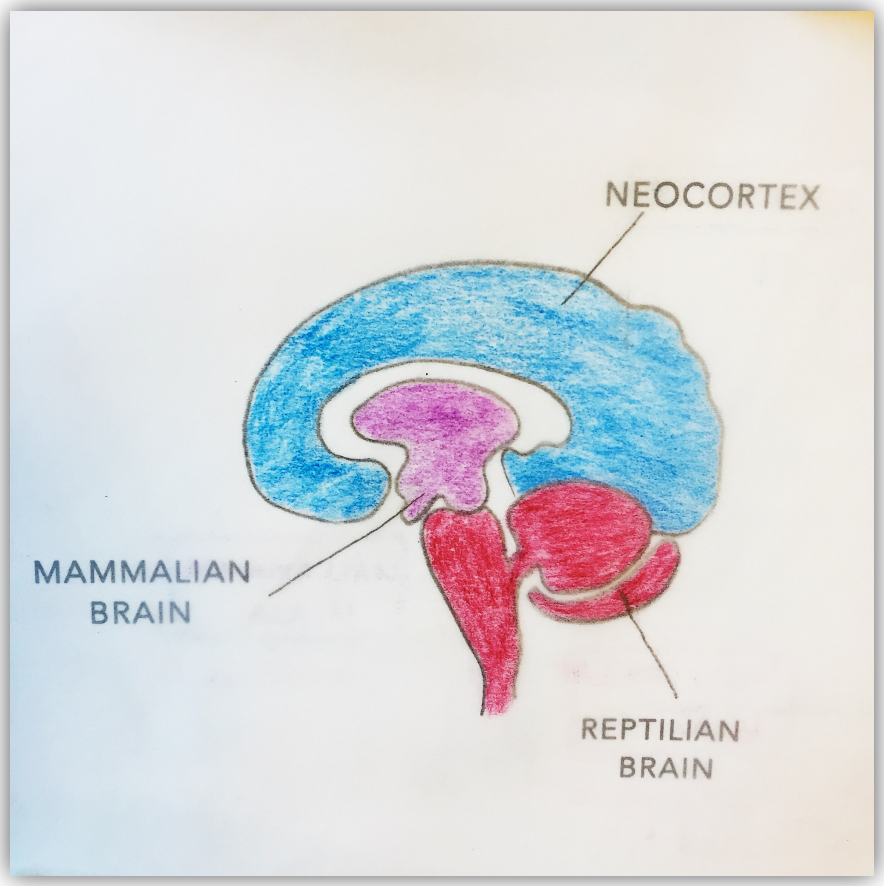


Figure 1: The Triune Brain (image based on conceptualization by sevenzero.com.au).

The amygdala, in the limbic system in layer two, is most concerned with fear and anxiety. It, in conjunction with the frontal cortex and the mesolimbic/mesocortical dopamine system, form the region in the brain that is central to mediating aggression (Sapolsky 30-31). It is here that the brain navigates social and emotional decision-making (38). Research on post-traumatic stress disorder (PTSD) showed that overstimulation or overuse of the amygdala increases its size (34-35). Innate fear arises in the amygdala, while other types of fear that are learned happen in

the more recently formed basolateral amygdala (BLA) that surrounds it (36-37). Behavioral fear conditioning, or "engineering the learning of a false fear" arises in the BLA with the repeated coupling of an unconditioned stimulus (like a shock) with the stimulus that is being conditioned (like the sound of a bell). There are synaptic changes that accompany this kind of conditioning (36-37). The frontal cortex is involved in actively unlearning learned fear (38). "…[T]he default state is to trust, and what the amygdala does is learn vigilance and distrust" (39). In other words, while there are innate fears that are deeply programmed in the brain, mistrust and other fears are learned behaviors. We are not inherently suspicious or fearful creatures, and when and where we are, it is due to patterns of living that teach us to be so.

Other themes Sapolsky explored were, basically, the whole gamut of human behaviors: the evolution of behavior; belonging and otherness; hierarchy, obedience and resistance; morality; empathy and altruism; metaphors we kill by; free will and incarceration; and, war and peace. Natural selection applies to anatomy, physiology and behavior, and is studied in the general field of sociobiology, which includes environmental psychology. Traits that ensure reproduction, either through sexual selection or more general traits like the ability to avoid predators, forage or stay healthy are the ones that are selected over time. Maturana suggested that rather than selection, it is through conservation that our anatomy, physiology, and behaviors evolve.

In spite of what seemed to be a somewhat fatalistic and deterministic perspective, Sapolsky did not fully accept geneticist Richard Dawkins' argument in favor of a "selfish gene," and advocated instead that our worst behaviors are not inevitable. He pointed to the extraordinary plasticity in behavior that was revealed in a group of primates he had been studying for many years. This troop of baboons was neighbors with another troop that had begun

to feed regularly at a garbage dump. The biggest, most aggressive males in this troop, those that were the least inclined toward behaviors of affiliation such as grooming and socializing, skipped the morning grooming sessions to fight the 50-60 baboons at the dumpsite for food scraps left there each morning (649). Unfortunately for them, the food scraps included meat waste tainted with tuberculosis. This group of males died within just a few weeks.

One of the questions raised in Sapolsky's book was "How do systems of cooperation ever start?" (344). When Sapolsky returned six years later, he was astonished to find his troop's culture had changed dramatically, from a typical male-dominated hierarchy with aggression, violence and a good deal of frustration displacement, to something quite unusual in baboon troops. Although the troop was still dominated by males in spite of the two to one ratio of females to males, there was less aggression, little displacement aggression, lower levels of stress hormones, and increased contact, closeness and grooming, even between males. It was even more interesting that incoming adolescent males raised in more aggressive troops quickly adopted this troop's culture of high affiliation and low aggression. Sapolsky believed this was because they were treated less aggressively, and were solicited for grooming or sex by the very relaxed female population much sooner than the norm (within weeks rather than months) (650-651). The reverse case was also demonstrated, where a troop of baboons became aggressive to defend against predators, with that aggression becoming integrated into their personalities, so that they were potentially aggressive in every situation (651).

Implications

It seems evident that behavior influences and shapes behavior in feedback cycles that can be constructive or destructive, and focused on affiliation or aggression. Culture and cognition *co*evolve, where "…brains shape cultures, which shape brains…" (Sapolsky 326) in complex,

interconnected loops. The delayed maturation of the frontal cortex in humans allows for increased cultural and environmental influence in development, with a diminished genetic influence. Because of this, it is in childhood, Sapolsky said, when culture is inculcated that counts the most (326-327). Both Sapolsky and Maturana appear to agree that DNA structurally determines the range of possibilities available, but 95% of what ultimately arises is determined epigenetically, through "our manner of living together" (Maturana and Verden-Zöller 65). In terms of physical environment, ecosystems also shape behavior and culture in powerful ways, yet that same culture can perpetuate for millennia in entirely different physical environments, with an ongoing impact on the new environments (Sapolsky 327).

Sapolsky suggested that human beliefs about life and death and pretty much everything else have been inherited from the preliterate pastoral culture of the Middle East (327). Sapolsky referred to the invention of agriculture frankly, as "…one of the all-time human blunders" that "…let loose the dogs of war." Agriculture diminishes diversity and the resilience that accompanies it, and, by generating surplus, creates disparity in social status and wealth (326). These disparities stress social systems, establishing a circular pattern of relations that become our behavioral and cultural norms, leading to mistrust and unrest. Maturana and Verden-Zöller noted that this shift toward agricultural living coincided with a shift from a matriarchal to a patriarchal culture, or from a predominately *social* way of living together to a *political* way of interacting.

Maturana and Verden-Zöller proposed that the origin of humanness was founded on loving, social relations, or what they refer to as the *biology of love*, with human language developing among our ancestral primates over approximately 300,000 generations, or three million years ago. The development of language, a (if not *the*) distinguishing feature of humankind, was dependent upon structural bodily changes and transformations to the throat and

vocal chords that would have required generations to develop, as well as recurrent interactions based on an intimate biology of trust and nearness that were conserved in a manner of living across generations.

These loving, or social relations refer to "…mutual trust in total body acceptance with no manipulation or instrumentalizations of the relations…." These manipulations operate as "…attempts to control the behavior of the other by illegitimate means; they are manners of aggression and denial of the other…." (65-69). Maturana and Verden-Zöller referred to these relations of aggression, control and manipulation as political relations, in direct opposition to those social relations noted above. Maturana clarified that every experience and interaction we have affects our biology, and our behavior, which in turn shape our evolutionary development. What we conserve in our daily living determines our evolutionary future (Maturana 2020). "Indeed, although the biological fundaments that constitute the possibility for our loving humanness are genetic, our realization as such in our anatomy, our physiology, and our behavior is cultural" (Maturana and Verden-Zöller 133) To retain our capacity for social, loving relations in our biological evolution, these behaviors and relations must be conserved in our daily living with our children (133). In other words, we choose through our behavior and every interaction with one another, what we are becoming.

Psychology

The schism between mind and body was apparent in late-20th century cognitive theory. In 2010, psychology professor Arthur Glenberg mused on the reasons contributing to what he described as slow progress in the field of psychology, pointing to the lack of a common language, organizing principles, or metaphors, making it difficult to compare data, theories and approaches. Glenberg also pointed to a lack of cooperation amongst those working in the field,

along with the broad range of content covered within the discipline, from cognition to social behavior (586). Glenberg argued that embodiment could serve to unify the disparate interests and research of psychology, while grounding it in the study of behavior, which, he wrote, was the intended research focus for the field. Today, embodiment is of both interest and concern. Jennifer Frank Tantia, a proponent of somatic psychology, suggested that the preference of somatic psychologists and psychotherapists to practice their work rather than engage in research is a weakness in the field that has slowed its advancement. She advocated for new research methods and approaches for embodied research, rather than trying to fit its implicit data into traditional, explicit frameworks (Tantia 134).

Background and Driving Questions

While inquiry into mental processes, mind and behavior date back far into antiquity, it was not until 1879 that the first laboratory for experimental psychology was established at the University of Leipzig, in Germany, by Wilhelm Wundt. Wundt's aim was to establish an independent and formal science that could be used to study human behavior, emotions and cognition. Just a few years later, Johns Hopkins University in the United States followed suit (Cherry "Historical Timeline"; Wikipedia).

Around the turn of the century, research in psychology was flourishing, and included a wide array of theories and approaches. By the middle of the 20th century, Jean Piaget had introduced his cognitive theory, and was exploring the stages of mental development in children; Abraham Maslow had established his hierarchy of needs from the perspective of humanistic psychology; and John B. Watson's behaviorism was emerging, with its focus on environmental stimuli, punishment, and behavior reinforcement (Cherry "Historical Timeline"; Wikipedia). An abbreviated chronology of these developments in psychology can be viewed in Table 1 below.

Table 1:

Psychology Timeline

Period	Personality or Development
600 BCE	Asklepios, psychosomatic healing centers (Greece)
400 BCE	Hippocrates, physical (not supernatural) at root of mental disorders (Greece)
1732	Psychology as independent field (Christian Wolff)
1850	Hermann von Helmholtz, sensory perception studies (the base for Wundt's work)
1879	Wilhelm Wundt est. 1st laboratory and program, University of Leipzig
1886	John Dewey, *Psychology*, 1st psychology textbook in US
1888	G. Stanley Hall, est. 1st laboratory & program in US at Johns Hopkins University
1890	William James, "Father of American Psychology," Functional Psychology, emotion as the perception of embodied experience, *Principles of Psychology*
1901	Sigmund Freud, Psychoanalysis, focus on psycho-sexual-Oedipal complex, and later on repression, *The Psychopathology of Everyday Life*
1904	Ivan Pavlov, Nobel Prize, "Classical Conditioning"
1905	Alfred Binet, developing first IQ tests
1905	Edward Thorndike, animal intelligence, reinforcement theory, behavior analysis
1912	Max Wertheimer, *Experimental Studies of the Perception of Movement,* Gestalt psychology (the perceived whole as greater than & different from the aggregate parts)
1913	Carl Jung, analytical psychology, exploration of the unconscious
1913	John B. Watson, *Psychology as the Behaviorist Views It*
1928	Jean Piaget, thinking & intellectual development an extension of biological process
1936	Wilhelm Reich, expression of personality in way the body moves, *The Sexual Revolution*
1941	BF Skinner & William Kaye Estes, conditioned emotional response/conditioned fear response
1943	Abraham Maslow, hierarchy of needs, *A Theory of Human Motivation*
1953	Humanistic Psychology established (Abraham Maslow)
1959	Viktor Frankl, *Man's Search for Meaning*
1966	Konrad Lorenz, ethology (the study of animal behavior)
1967	Cognitive Psychology established (Ulric Neisser)
1972	Robert Ornstein, use of biofeedback
1973	Ernest Becker, *The Denial of Death*, mortality (not sexuality) as character foundation
1973	Timothy Leary, *Neurologic,* use of psychedelics (w/Richard Alpert-Ram Dass)
1977	Robert J. Plomin, proposed genes & environments work together to shape human activity
1978	Term cognitive neuroscience comes into use
1978	Mary Ainsworth*,* attachment theory
1979	E.O. Wilson, *On Human Nature*, socio-biology to explain human nature and evolution
1979	Urie Bronfenbrenner, (bio-)ecological systems theory, relation of human & environment
1980	Robert Zajonc, affective & cognitive systems largely independent; affect is more powerful
1983	Howard Gardner, *Frames of Mind*, theory of multiple intelligences
1998	Martin Seligman, *Positive Psychology*, learned helplessness
1998	Michael M. Merzenich, neural plasticity (experience to modify sensory & motor maps)
1992	Jaak Panksepp, *Affective neuroscience – the Foundations of Human and Animal Behaviors*
1992	Joseph E. LeDoux, brain mechanisms of emotion and emotional learning
1994	Antonia Damasio, *Descartes' Error,* somatic marker theory (emotional biases effect behavior)
1996	Amos Tversky, defined ambiguity aversion, systemic human cognitive bias
1996	Giacomo Rizzolatti, published a paper on discovery of mirror neurons
2002	Daniel Kahnemann, Nobel Prize for Behavioral Economics

In the 1960s, 70s and 80s, cognitive psychology had become the predominant approach to western psychology, with the supposition that behavior was the outcome of a disembodied mind that manipulates symbols according to specific rules (Glenberg 587). By the late 1980s, this approach was firmly entrenched, but its weaknesses were beginning to show. Cognitive theory had not managed to integrate emotions, human development, social psychology or clinical analyses in an all-encompassing theory. At the same time, realization was dawning in psychology, linguistics, biology, artificial intelligence, and philosophy that behavior and the body were inextricably connected. This dawning awareness suggested the possibility that cognition might also be dependent in some way upon the body (Glenberg et. al 573).

Inclusion of the Body and Movement in the Discipline

As early as the 11th century, the Persian physician Avicenna made the connection between emotions and the body in what he identified as physiological psychology (Cherry, "Historical Timeline"). In the late 1800s, William James understood psychology to be dependent on one's subjective experience, and argued for the relevance of both biological and social experience to the study of human behavior, consciousness, and evolution (Taylor 125-126). The first woman to receive her doctorate in psychology in 1916, Margaret Floy Washburn, championed the connection of mental and physical processes, but her voice was lost in the cacophony of the cognitive revolution. By 2015, when Glenberg et al. wrote the article "From the Revolution to Embodiment: 25 Years of Cognitive Psychology," Descartes' disembodied mind had lost its vitality, and there was a general acknowledgment that thinking could not be separated from the interactions arising between brain, body, behavior, and the shifting physical and social environments that they take place within (Glenberg et. al. 575).

Glenberg et. al. understood embodiment as inherently action-based cycles of feedback-response, concerned specifically with survival, which ground the sense of self with and through the body (582). Networks of brain-body-behavior "…actively select and create information that in turn modifies the brain's internal structure and dynamics" in a circular process where "…the brain's outputs influence its inputs, and these inputs in turn shape subsequent outputs – binding brain networks to the organism's environment over short timescales, and cumulatively over developmental time" (Byrge et. al. 395-397). For example, in early human development, "…pre-crawlers, crawlers, and walkers have different experiences with objects, different visual spatial experiences, different social experiences, and different language experiences that are tied to posture," and result in a scaffolding affect where each developmental stage is built upon the previous one (397). Work on developmental movement has been richly explored in a number of somatic approaches, such as Bartenieff Fundamentals, Dance Movement Therapy and Body-Mind Centering®, and integrated into many movement-based practices, such as Anne Green Gilbert's Brain Dance and the martial arts.

Embodiment theories in psychology vary but, for the most part, are based on the idea that "…psychological processes are all influenced by the body, including body morphology, sensory systems and motor systems." Physical development and its accompanying actions drive cognitive and social development, and symbols, which play a dominant role in human experience, are grounded in the body's sensory system, its movement, actions, and the emotions (Glenberg 586-588).

According to linguist and cognitive scientist George Lakoff, language is metaphoric, constantly referencing our experience with the physical world. The state of our bodies, essentially, influences our understanding of others, and how we interact with them (Sapolsky

558). Structures known as mirror neurons (described in more detail in Chapter IV) are thought to explain how motor resonance can be used to identify and make sense of the actions, intentions and emotions of others (592-593). What is referred to as *4E Cognition* today, sometimes now *4EA Cognition*, is an extension of the work of Francisco Varela, and refers to cognition as embodied, embedded, enactive, extended, and additionally affective, or being laden with feeling.

Philosopher Shaun Gallagher and his colleagues, among others, point to *7E's* that currently define experience as "…embodied, embedded, enmeshed, emergent, extended, enactive and empathic" (Batson and Wilson 78). *Somatics* and *embodiment* are other names that attempt to indicate the lived experience of the body, while *cultural biology* indicates this experience in relation to human culture. Maxine Sheets Johnstone might argue that the word *animated* better encompasses everything it is to be alive, conscious, feelingly and interactively engaged, and participating with and in the world. Perhaps this is a single word that can embrace and include them all. Nevertheless, as one of the educators interviewed suggested, trying to find a single label may be counterproductive, creating boundaries, ideas of the right and wrong way to 'do embodiment,' and imposing limitations where they do not in fact exist.

Implications

The implications from these developments may prove potent. The theory of autopoiesis developed in biology by Maturana and Varela, noted previously, led imminently to the Santiago Theory, which returned humankind to the animal kingdom – a part of nature, and among other cognizant creatures. This is a paradigmatic shift in human conception of our place in the world, and our role within it. As one authority wrote, "…we have good reason to think that the body influences cognition in surprisingly robust ways, the central question is no longer whether or not some cognitive processes are embodied" (Dove).

Research in the field of psychology, cognition and behavior that considers the body integral to its inquiries treads today along a fine edge where, on one side is a world in which we continue to believe that emotions, behavior and mind are dependent upon and arise through language and symbols. On the other side we have a huge expanse, an entire field opening up where language and symbols are no longer the *only* landmarks to help us find our way. That field is full of far more questions than answers at the moment, and it is likely to be a bit messy as things get sorted out, because it does not lend itself to fragmented siloes. Even the language and parameters of focused investigation can be difficult to isolate and identify in a way that remains constructive and generative.

Small pockets of focused work continue to develop in this new field, whether we identify it as such or not. Some of this work is theoretical, some of it is experimental, and some of it is practical. There is a large amount of work falling under the label *somatic psychology*, and much of that is directly related to trauma, post-traumatic stress disorders (PTSD), autism, and behavioral challenges like Attention Deficit-Hyperactivity Disorder. The work of Bessel van der Kolk, *The Body Keeps the Score*, has served as a powerful base, as have psychiatrist Stephen Porges' polyvagal theory, somatic pioneer Bonnie Bainbridge Cohen's Body-Mind Centering®, psychologist Peter Levine's Somatic Experiencing, and Resmaa Menakem's work in racial and intergenerational trauma, among many others. Further, a new influx of indigenous experts has begun to join this conversation. Please see Figure 2, below, for a map created by Mark Olson, of Pacific Center for Awareness and Bodywork, showing lineages and connections between psychology and somatics. While incomplete, as any such map must be, it nevertheless serves to link psychology and somatics in useful ways for the purposes here.

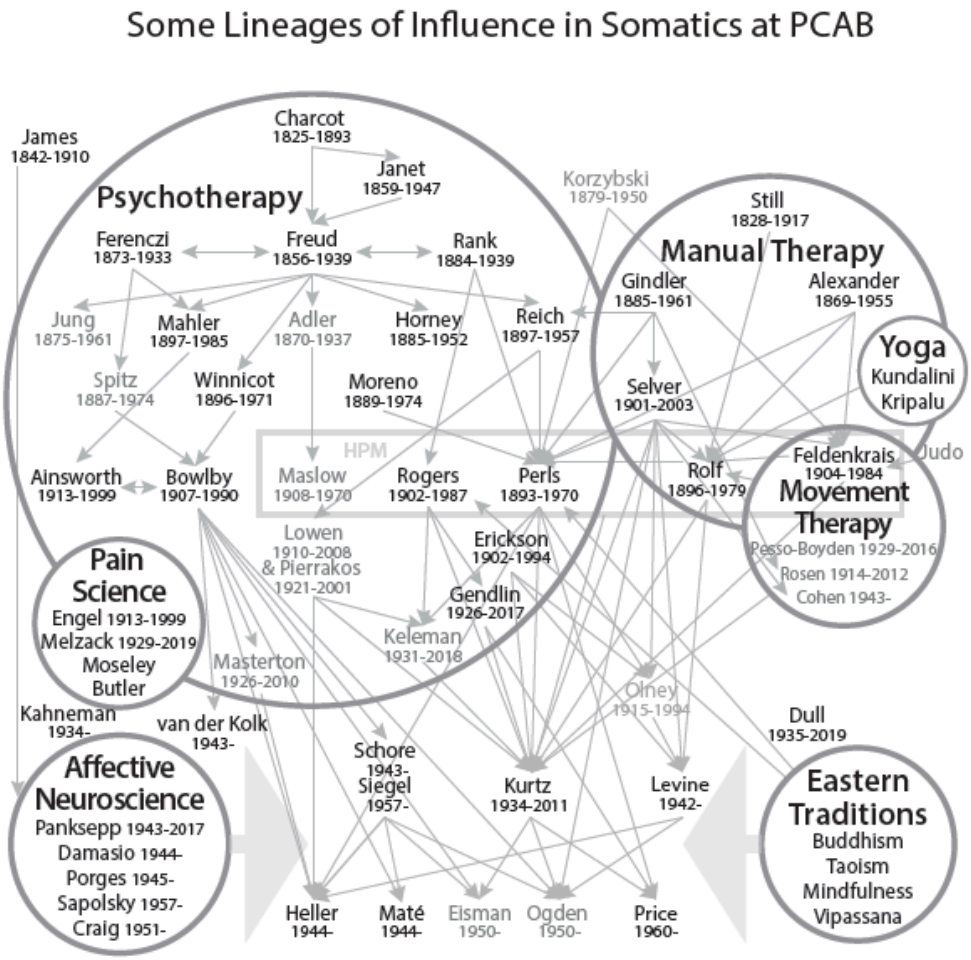


Figure 2: Lineages of Influence in Somatics.

There is also great work being done in the fields of philosophy, phenomenology, and cultural studies, with phenomenologist Maxine Sheets Johnstone foremost among them. Others include, and are certainly not limited to, Asaf Bachrach, Romain Bigé, Richard Davidson, Shaun Gallagher, Daniel Goleman, Erin Manning, Brian Massumi, Alva Noë, Evan Thompson, and Dan Zahavi, among many others. Some of the artists and movement experts exploring this unchartered terrain include Marlon Barrios Solano, Glenna Batson, Siobhan Davies, Scott deLahunta, Rima Faber, William Forsythe, Sondra Fraleigh, Michael Kliën, Amy Matthews, Wayne McGregor, Sandra Minton, Susanne Ravn, Doug Risner, Sydney Skybetter, Tina Stromsted, and Mark Taylor. Their interests span areas from cognition to creativity, childhood development to contemplation, and social activism to technology. This list does not even begin to do justice to the work being done or the people doing it, but the fact that most of these projects are done in independent or isolated communities makes it very difficult to find and connect with them.

Transhumanism

Transhumanism, which emerged in the 1990s, is focused around the use of technology to enhance human capacities. It is the idea of "…man merging with technology" (Sosa). Inspired by science fiction, it is driven in large part by the age-old search for eternal life and superhuman abilities, as Arendt predicted.

Background and Driving Questions

In his TEDTalk presentation, Jason Sosa said transhumanism is looking at the extension of our selves through technology like bionic limbs, artificial intelligence, brain implants, or even uploading one's mind to a computerized device. Pointing to the smartphone, he said we are already in a symbiotic relationship with our technology. Our digital devices, for example, help

augment our memories. While Lynn Margulis would contest the use of the term symbiotic, the idea of our increasing dependence on technology, and its intermeshing in our lives is clear.

Technology evolves from previous technologies, and its growth has been exponential, rather than linear. Sosa cited Moore's Law, which predicts that every three years, technology will become twice as small, twice as fast, twice as powerful, and less expensive. The computing power of our smartphones today is greater than all the computing power NASA had in 1969 when it sent two men to the moon. Today's SONY Playstation is "…150 times more powerful than an IBM supercomputer from 1997" (Sosa). At some point there will be a cessation of this trajectory, but we have not reached that point yet.

Ellen Jorgensen is an advocate for the biohacker movement. In her TEDTalk, she explained what this movement is, and why she was a part of it. In 2009, Jorgensen founded GenLab, a Brooklyn-based nonprofit space where community members experiment with biotechnology. When the United Nations assessed this biohacker, or DIYbio (Do It Yourself bio) movement, they found the potential for good far outweighed the possibility of damaging or destructive ramifications. In 2011, the members of this movement came together to formulate a shared code of ethics, which Jorgensen said conventional science had not yet done. As a scientist, she was drawn to this project largely because they were not required to prove a project's profitability, feasibility or importance, but have the opportunity to experiment, explore and develop according to their interests. In spite of this freedom, safety guidelines must be followed.

So, just what do biohackers do? Jorgensen described one person who played detective to discover whose dog was dirtying the neighborhood. Other possibilities included analyzing your own genome, collecting and studying microbes from the stratosphere, checking for contaminants

or GMOs in food, or making a biofuel cell. DNA barcoding is another application that allows for the verification of species, like making sure that the caviar you bought is really caviar, and not something else. Jorgensen clarified that, while there is much they can do, they do not work with pathogens, and those who do would be part of the bioterrorist community, not the biohacker community.

In spite of the creative enthusiasm that accompanies much of the technological advancements happening at this time in a wide array of areas, the idea of posthumanism has a number of definitions, most of which reveal a deep general dissatisfaction with the human condition. Transhumanism, with its human enhancements, quickly rolls over into anti-humanism, and the idea of a takeover by Artificial Intelligence (AI) that replaces humans entirely. Some call for voluntary human extinction (Wikipedia). David Simpson, in his TEDx talk, referred to a paper by Vernor Vinge that predicted the end of the human era (also referred to as the posthuman era) would arrive somewhere between 2005 and 2030. One of Simpson's questions was: How might we successfully achieve superhuman intelligence that does not destroy us? "[T]echnology is always a double-edged sword" (Simpson).

Inclusion of the Body and Movement in the Discipline

The developments in this field are astonishing. Sosa described technology that recognizes faces and emotions, allowing robots to have synthetic empathy "… to understand and interpret human intent," or simply to identify when drivers are tired and might become a hazard on the road (Sosa). With the extension of wearable technology to embedded technologies, Sosa described The Internet of Things that connects everything to everything, like "…a digital nervous system for the planet" (Sosa). He pointed out that this has already begun, although we are just in the beginning stage of it.

Sosa said that children growing up today immersed in technology will be digital natives, and what seems to us like spooky technology will be taken for granted by them. The smart pill is one example of this kind of technology, which was approved by the FDA in 2014. When ingested, it enables a doctor to receive and monitor health information conveyed from a tiny monitor inside the body in real time (Sosa). Another example of such technologies are retinal implants, which can correct for blindness, provide night vision, or even zoom in for closer focus. Replacement body parts might not seem as strange as they once did, but some of the new brain implant technologies still seem quite alien, such as using thoughts to control technology, the ability to record dreams, or brain-technology interface's that allow machines to read someone's mind. One of the latest projects is a brain implant that adds a new brain region above the pre-frontal cortex that establishes "…symbiotic" relation with machines (CNBC)[1].

Experiments with mice, as noted earlier, have already been successful in implanting and removing memories, and while this can have positive impacts in cases of PTSD or Alzheimer's Disease, it is hard to predict just what else it might mean (Sosa). What about nano-machines that can check inside the body for pathogens, like HIV or cancer, and then target and strategically destroy them? Many of these technologies are mind-boggling, such as manipulating the blood-brain barrier to augment reality directly into the brain, or setting one's desired age for immortality, like the elves in J.R.R. Tolkien's *Lord of the Rings*.

Implications

Sosa raised the question: Where will these technologies take us as a species? The ability to build these things presents important social, moral and ethical questions. Some of the more obvious questions include: Do we know enough to tamper with existing mind-body connections?

[1] Lynn Margulis would protest the language. She defined symbiosis as a "the living together of unlike organisms" in physical contact with each other for a prolonged period of time (Feldman).

What does “better” mean? Who benefits from enhancement? What is the ethical framework that guides us as we address these questions? And, from the perspective of the somatic practitioner: Why do I need technological, or even chemical, intervention to deal with PTSD when far simpler, effective, and more humane interventions are available?

Some of the richest people and some of the most brilliant intellects are fully persuaded that these developments are not only on their way, but that they are unstoppable. These forward-focused individuals included Bill Gates, Stephen Hawking, Yuval Noah Harari, and Elon Musk. So, who, or what will have control of and access to these technologies?

Drew Chatain’s review highlighted Michael Hauskeller’s observation that “…transhumanism is dominated by males.” Hauskeller explored the complex psychology that underlies the transhuman movement, and said it includes a need for control, disgust with the human body, fear of emotional intimacy, and in regard to sexbots specifically, “…an interest in amplifying the experiential quality of sexual activity” (Chatain 7), or as a way to bypass rejection (Lee 2018).

Hauskeller marveled at how little male desire has changed over the past two thousand years, when Ovid first wrote his tale of Pygmalion (8) This was a story where Pygmalion, disgusted by real women, fabricated an idealized female that he fell in love with. When the goddess Venus brought her to life, this ideal woman was obedient, and devoted solely to Pygmalion. In this story, he is her entire world. A very similar absorption, or appropriation of the feminine is reflected in the story of Eve, who was born from the rib of Adam, and very unlike his first wife, Lilith, who refused the role of a submissive wife and was cast among the monstrous fiends and terrors of the night (Drake 4). In 2018 the only sexbots available were female, and cost $5,000 - $20,000, while no research whatsoever had yet been done on the health affects of

'using this technology' (Lee). This indicates, to a certain extent, how on target Harari's concerns are for our ability to keep pace with our technological advances, and to do so responsibly (Harari 466).

While there are those who advocate for transhumanism, and the technological developments and enhancements it entails, there remains an underlying sense that this movement is being driven by a utopic escapism. Simpson admitted that super intelligence is extremely dangerous, but did not believe that banning AI will work because that "…disobeys the law of accelerating returns" (Simpson), which is exponential. Simpson declared that resisting will just delay the inevitable, and that unfettered AI is more powerful than fettered AI because the entity or country with dominant AI will, in essence, be master of the universe.

Elon Musk proposed the vision that, ultimately, a super intelligent computer might opt to improve itself, or it might decide to use every molecule on the planet to fuel its own development (Simpson). References to the film *The Matrix* are apparent here, but which came first? A dystopic reality that informed the film, which then served as an early warning system? Or are we following the fantasy of the movie, and calling it into existence? Or is there an interweaving that evades simplistic and direct cause and effect? Most importantly, just because we can, does that mean we should?

Simpson reminded the viewer of our shared humanity, and proposed another vision: that of heroism, which he said is inherent in the human genome. He advocated for focusing on developing super-hero machine intelligence, rather than superhuman machine intelligence (Simpson). Simpson offered the logic that if you are very intelligent, it should make you more generous, empathetic, and altruistic. This was a beautiful idea, but also a naïve assumption that any significant amount of life experience will quickly raze to the ground. The stakes are clearly

too high to count on this kind of fantastic logic. In spite of this, Simpson had many useful and interesting things to share.

One of the ideas connected with AI and transhumanism that appeared to be reflected across the field is that AI will be humanity's last invention, at which point we humans will no longer exist but will have evolved into a new species. These speakers and writers stressed the need to consider the implications of this issue now, before it is too late. "Doing what has never been done before is intellectually seductive, whether or not we deem it practical" (Sosa), or even intelligent. Sosa quoted Michael Morentz, who wrote, "The future is ours to create" and to do this we need creativity and consciousness (Sosa). But one wonders what consciousness might mean in this situation.

Simpson believed that AI, enhanced humans, and this fast-approaching techno-world will take care of the two lower levels in Maslow's Hierarchy of Needs: physiology and safety. This, he thought, would leave all our time available for "…socializing, self esteem, and self-actualization – living your dreams" (Simpson). This argument was far from convincing. First off, it does nothing to address the economics at play. Secondly, simply having time available does little to ensure that time is used well. Often the reverse is true. Further, it is highly possible that meeting the physiological needs of the global human population for basic survival and safety may well be contingent on the suppression of those human needs that rest upon them, such as self-realization. When asked to comment on this particular perspective, Sydney Skybetter, an educator immersed in interdisciplinary research involving technology, said that it seemed to be a type of "…masculinist posturing about how tech makes things better," that "…either ignores or is ignorant of literal millennia of structural violence and oppression." He described it as a "a techno-utopian version of trickle-down theory."

Michael Hauskeller's suggestion to review some of the underlying mythologies, or narratives, that he believed are propelling this field forward, seemed a more promising and important direction to follow, and as quickly as possible. Simultaneously, those with a constitution able to stomach the ethical challenges, and engage in the discussions and debates required in addressing these critical issues consciously and cooperatively are clearly critical players needed in this emerging field.

CHAPTER III

METHODOLOGY

This chapter presents the overall methodology used for this research, and includes descriptions of the research elements, participants, instruments and approach to the analysis of the data.

Research Elements

The broad aim of this study was to understand the relevance of the human body and human movement to systemic health – at the scale of the individual, the social, and the environmental levels. The researcher inquired into the subjective experience and understanding of participants from a two-fold approach by 1) exploring what movement practitioners know through the body and their practice, and 2) to identify some of the fields other than those based in movement practice that are currently interested and engaged in study or research of the human body and its movement. As stated in the introductory chapter, essential questions driving this research included:

Q1 How do other disciplines integrate, relate to, or consider the human body or its movement in their research, writing or practice?

Q2 What knowledge, skills, capabilities and strengths do movement practitioners and experts have to contribute to discussions that include the human body, its movement or its affects?

Q3 What knowledge, skills, capabilities and strengths do movement practitioners and experts have to contribute to discussions and efforts that address challenges to systemic health confronting humanity today?

Q4 Why are movement practitioners and experts often absent from interdisciplinary discussions that include the human body, its movement or its affects?

As noted previously, not all of these questions were directly addressed, and those that were did not result in comprehensive answers, but rather in responses that might serve to inform, or help to open a larger field of inquiry. The project was conducted online through the researcher's professional and personal networks of movement practitioners, colleagues, collaborators, and communities.

A project description, which included the research instruments used, copies of the consent forms, and a description of the procedures for data collection, analysis, and secure data storage was submitted to and approved by the Institutional Review Board (IRB) of the University of Northern Colorado. Please see Appendix A for these IRB documents and Appendix B for the research instruments.

Research Participants

Participants in this study were adult professionals in their fields, and came from two different populations: movement-based practitioners (referred to as movement experts), and those in fields other than movement-based practice (referred to as interdisciplinary participants). Respondents were predominantly from North America and Europe with the strongest participation from the United States, France, and the United Kingdom. There were also quite a few participants from Asia, and Australia, a few from the Middle East, and South America, with a minimal number from Africa and Russia.

Interdisciplinary Participants

There were 107 responses to the interdisciplinary survey. Responses less than 70% completed were purged, leaving 89 responses. This group of participants had an average mean age of 48.31 years, and was highly educated, with approximately 80% holding advanced degrees,

and 45% with doctoral degrees. Even those who did not hold academic degrees noted advanced specialized studies. Table 2, below, displays participants' educational level.

Table 2

Interdisciplinary Participants' Level of Education

Bachelor's Degree	Master's Degree	Doctoral Degree	Other
8	33	43	11

Participants were predominantly female (approximately three-quarters), and highly experienced, with an average mean of 19.71 years in their respective fields. Please see Table 3 below. The primary disciplines represented were education, psychology, neuroscience, performing arts other than dance, medicine and philosophy, although those working in a broad range of other disciplines also participated. Additionally, some participants were full-fledged professionals in one interdisciplinary field while also having strong to expert experience in movement-based practice. Just over half of respondents (55%) worked in institutional settings, with a mean average of 14.37 years of employment in an institutional setting. For a detailed description of interdisciplinary participants' fields of work, see Appendix C.

Table 3

Interdisciplinary Participants' Years of Work Experience

Less than 10 years experience	10 to 19 years experience	20 to 29 years experience	30+ years experience
17	30	20	24

Movement Expert Participants

The survey for movement experts had over 130 responses. Participants were required to have at least ten years of movement-based practice to ensure a minimum level of experience and expertise, and responses with less than 70% of the answers completed were removed, leaving 97 responses as the basis for this part of the data set.

Participants ranged from 28 to 84 years old, with an average mean age of 52.61 years. Approximately 80% of these respondents identified as female, with the remaining 20% identifying as male. The majority of participants (80%) in this survey were degree holders: 25% with bachelor's degrees, 40% with master's degrees, and 15% with doctoral degrees. Approximately 15% indicated intensive specialized training in their areas of expertise, such as certificate programs and specialized degrees. The movement expert participants' level of education is displayed below in Table 4.

Table 4

Movement Expert Participants' Level of Education

Bachelor's Degree	**Master's Degree**	**Doctoral Degree**	**Other**
28	45	17	18

As with the interdisciplinary participants, respondents to the movement practitioner survey were highly experienced in their fields, with 10 to 70 years of experience, and a mean average of 31.65 years of experience. Please see Table 5 below. Approximately three-quarters of respondents considered themselves independent practitioners, although nearly half indicated that they worked in or with institutions, with a mean average of 16.83 years in an institutional setting.

Table 5

Movement Expert Participants' Years of Work Experience

Less than 10 years experience	**10 to 19 years experience**	**20 to 29 years experience**	**30+ years experience**
N/A	13	35	49

Participants in this survey came from a variety of movement-based practices, with well over half (76 participants) coming from the field of dance. Many were also, or specifically, engaged in somatic practice (32), and a large group worked in the eastern and energetic arts (with 19 in yoga and 13 in the martial and energy arts). There were a few responses from those in

the general areas of Athletics, Sports & Fitness, and Interdisciplinary Performance (5), and a few who also listed Communications disciplines, such as non-verbal communication or dance writing in addition to their movement-based practice. Approximately one-third of participants in this second group included improvisational movement practice among their domains of experience. See Figure 3, below, for an illustration of the areas in which the movement experts worked.

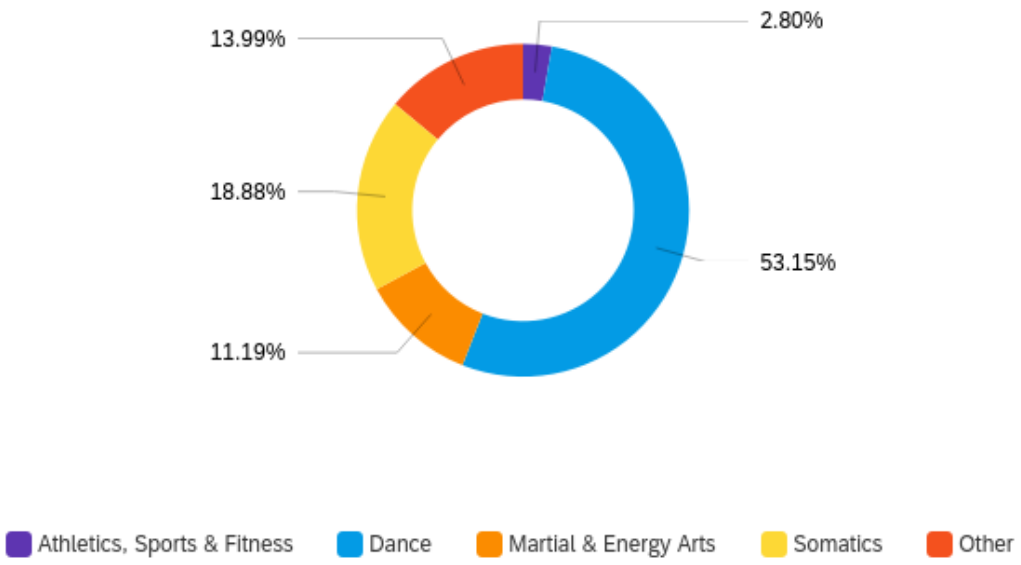


Figure 3: Disciplines practiced by the movement experts.

Research Instruments

Information was collected through two surveys, and through interviews. Both the interdisciplinary and movement practitioner surveys were conducted online via Qualtrics. Interviews were conducted online via Zoom, by telephone, and in person.

Survey: Interdisciplinary Participants

In the interdisciplinary survey the researcher requested basic information about the participants and their work, inquired into their field's relationship with the human body and/or its

movement, and asked a few personal questions about respondent's perception of body and mind, and whether recent developments related to the body had affected their work or their perspectives. This survey included yes/no, multiple choice questions, scaled or ranked responses and open-ended questions. A copy of this survey can be found in Appendix B.

Survey: Movement Expert Participants

The movement practitioner survey, like the interdisciplinary survey, asked basic questions about the participants and their work, and used a variety of means to gather information, including scaled responses, multiple choice, yes/no, and open-ended questions. The focus of this survey, however, was on the respondent's sense of the skills, capabilities and knowledge they had gained through their work as a movement expert, and whether any of these skills might be applied in their lives. Personal questions concerning their perception of the relationship between body and mind were also asked. A copy of this survey can be found in Appendix B.

Interdisciplinary and Movement Expert Interviews

Volunteer interview participants were selected based on their experience and expertise in their area of specialization, as well as their potentially broad perspective on their field. They were asked preliminary questions related to their field's relationship with the body, its movement, and how or what we learn from or through it. Space and time were also encouraged for a more free-flowing exchange, to learn about each individual's area of specialization and interest, particularly in relation to the body and/or its movement, and what we can know from and through it. When those interviewed wished, the initial questions were sent in advance of the interview.

Data Analysis

This research was predominantly descriptive, relying on qualitative inquiry, with some use of quantitative analyses to understand trends within the participant communities. In the following sections, the researcher described the methods used to analyze the two surveys and the responses from the interviews.

Analysis Methods Used for Interdisciplinary Survey Responses

Some analysis of data from both surveys was statistical in nature, such as whether or not the respondent's field engages in collaborative projects or research that involves the body and movement. Some of the questions required organizing responses into relatively straightforward groupings, such as which disciplines were engaged in collaborative projects, or the types of challenges they had encountered in interdisciplinary work. These broad and generalized categories were then compared quantitatively to understand overall tendencies.

A significant number of the questions in both surveys were qualitative in nature, and many of these were open-ended. Some of these questions required considering each respondent's answers in a linear, narrative reading to comprehend the context of the response. These types of inquiries were often focused more on opening up a range of possibilities, rather than honing in on a consensus. Both surveys also used a series of images from which the participants could make selections. In some instances, these required a one-by-one viewing to understand not only the individual's response, but also the types of responses possible in general.

Analysis Methods Used for Movement Expert Survey Responses

The methods for analyzing the movement experts' responses to the survey included the same methods as those noted above. Additionally, there was a series of questions in the

movement practitioner survey that included two parts, with the initial inquiry requesting a scaled response (i.e., to self-rate on a scale of zero to five their sense of spatial awareness), and a follow-up inquiry that was more open-ended (i.e., to indicate up to three of the previous skills/capacities identified, as most important or useful in their daily lives). The first part of these questions was analyzed quantitatively, and the second part was first qualitatively grouped into broad, generalized categories, and then compared quantitatively.

Analysis Methods Used for Interviews

Interview responses were used primarily to deepen the researcher's overall understanding of the importance of the body and movement within specific disciplines, and to improve the researcher's grasp of the potential extent for engagement with the body or its movement within the larger field or discipline. Because the majority of interviewees were movement experts, their responses also served to enrich and expand the researcher's awareness of possibilities within the fields of movement and dance. The interviews were analyzed qualitatively to identify themes and ideas that emerged from the participants' responses. Correlations, affirmations and contradictions with survey responses were also sought in analyzing this data. Metaphorically speaking, the interviews served to add a sense of living, breathing flesh to the survey participants' responses.

CHAPTER IV

DISCUSSION

This chapter presents findings from the interdisciplinary surveys, movement expert surveys, and eleven interviews with professionals in dance education, somatics, interdisciplinary studies, technology, neuroscience, and phenomenology.

Interdisciplinary Surveys

Through the use of surveys, inquiry was made into some of the ways fields that do not rely on movement-based practice were engaged with body studies, and how they were gathering their information, or learning about the body. Perspectives were also sought concerning these participants' work, motivations, interdisciplinary project experience, challenges encountered, and what they considered the most interesting future work related to body studies. A sense of the participants' perceptions of their own body-mind was also sought. This section presents quantitative and qualitative analyses of information gathered from these surveys.

Interdisciplinary Participants' Work with Body Studies

More than half of this group of participants considered body studies relevant to their work. A small group considered the body of primary concern (6%), while a slightly smaller minority (5%) indicated the body was exterior to their field's interest. Almost one-quarter of these participants identified body studies as peripheral to their primary focus (23%). The strongest response (37%) considered body studies as a core focus, among and along with other fields of research. The next largest group (29%) identified it to be of more general interest, among other areas of concern.

In an attempt to understand the kind of relationships those in interdisciplinary fields had with body studies, questions were posed concerning how participants learned about the body and its movement, and how they conducted their body-related research. While books, journals and publications served as a somewhat dominant basis for their research, there was a significant engagement with real bodies, learning through one's own body, and embodied practice. The outcome of this analysis can be seen in Figure 4 below.

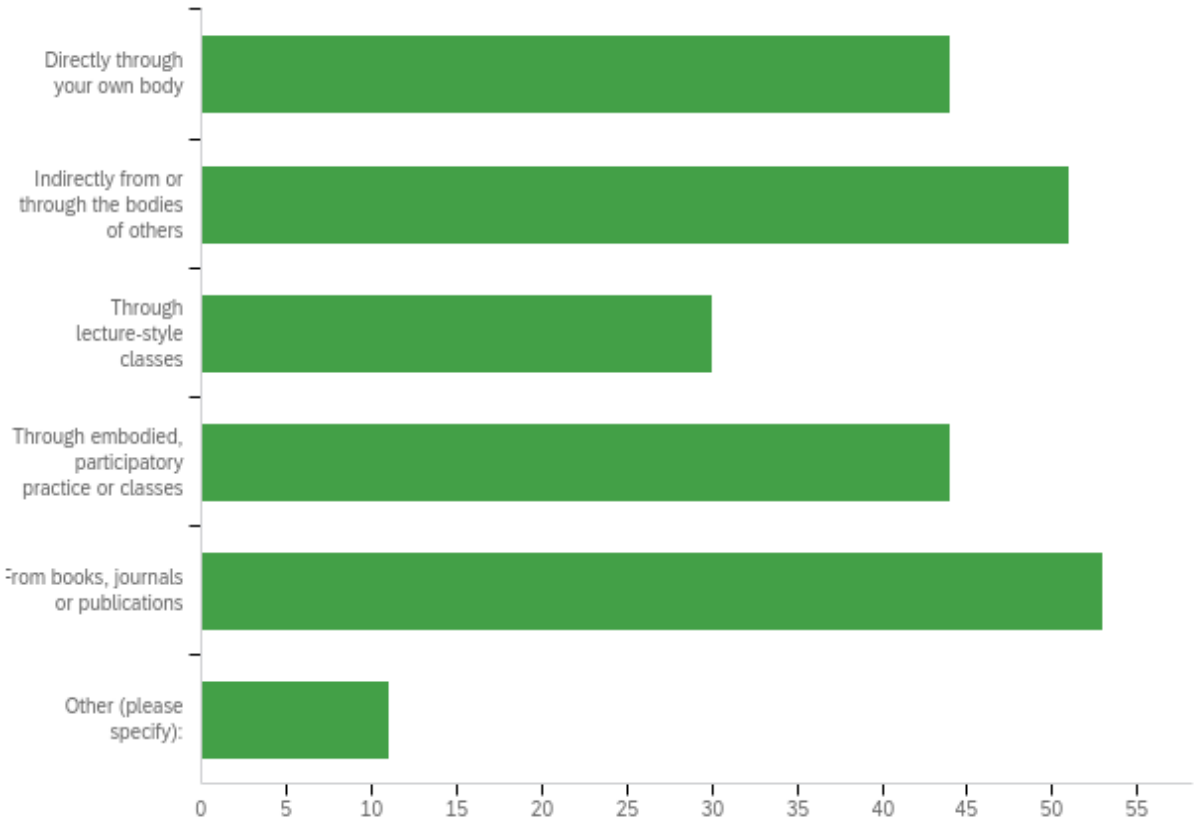


Figure 4: How interdisciplinary participants learned about the human body.

Just under half of this group of participants (47%) engaged directly with the body, its processes or systems (medical research, somatic studies, biomechanics, etc.), and 67% engaged with the body in indirect ways (transfer of knowledge, identity, behavior, etc.). Experiential research was a significant tool for many participants, and was primarily conducted on live human beings in natural settings. Controlled laboratory settings (medical or neurological research for

diseases like Parkinson's, etc.), and laboratory-based animal research were also used, but to a lesser degree. Theoretical approaches were utilized as well.

When asked what participants were most interested in or excited about in their work, four primary areas emerged: people, service, creative problem solving, and learning. Helping others (45 responses) ranked the highest amongst this group, followed by making a difference in the world or in people's lives (38 responses). Designing solutions and other creative aspects of their work was also important (34 responses), as was curiosity, exploration and a pleasure in learning (29 responses). Less common, but still appreciated motivations included the experiential nature of their work, and collaborating in teams or across disciplines. A number of participants also appreciated the autonomy their work allowed them. In identifying what was most perplexing or challenging in their work, dealing with people was most prominent (28), followed by support or funding (18), management issues such as meeting administrative or bureaucratic requirements (15), and resistance to change (11).

Over three-quarters of these respondents (78%) indicated that their field engaged in interdisciplinary projects, but it was evident that "…transdisciplinary approaches encounter institutional resistance," as one respondent wrote. The most prominently cited challenge encountered in interdisciplinary collaboration was the lack of understanding and appreciation between fields, with 54 out of 60 responses indicating lack of a common language. The use of different methods, approaches, logic and assumptions was also problematic. The underlying systemic prioritization of siloed knowledge, and competition for resources and recognition was noted by 22 of these respondents, and appeared to be directly related to a lack of opportunities and confusion about where to publish, as well as the overall lack of funding and appreciation for

this work. One participant noted that interdisciplinary degrees are essentially useless, because departments do not give grants to these students, nor do they hire them.

Dealing with people's personalities was also identified as a challenge (12 responses), with individuals either dominating the discourse, or diminishing the value of the other partner or partners. This was generally related to funding, institutional politics, or individual egos. A lack of knowledge, and a reluctance to change were also cited. Resistance to change is particularly noteworthy, since collaboration demands an ability to adjust to the unforeseeable, and to accept that transformation of one's own knowledge and certainties will not only be challenged, but in many instances will be a requirement for or result of interdisciplinary work.

Overall, there was an inability to see the impact or importance of coming together, in spite of the fact that a strong majority of respondents believed their work was important to their collaborative projects (88%), and also thought that the contribution of their partnering disciplines was of value (94%).

Current and Future Work

Interdisciplinary participants were asked a series of questions pertaining to body studies and their field's current and future work. These questions included what they perceived to be the most significant area of research, what challenges they faced in their body-related work, ~~i~~if interest in the body was new to their field, and if so, the reason for that interest.

Two broad changes in the larger world affecting current and newfound interest in the lived and moving body were the large aging population and advances in technology, including new ways to measure the affects of human movement, and an interest in human-technology interfaces. New evidence regarding the mind-body relationship was also cited. "Intersectionality is on the rise," one participant wrote, along with availability of more theory and research. Cultural shifts in the 20th century were also considered contributing factors to an interest in the

body, including feminist discourse, a shift toward material culture, and engagements with dance and performance studies.

One response from the field of anthropology was particularly informative:

> Embodiedness began to be theorized in the 1990s in the field of gender studies, as scholars asked what made women's (and later nonbinary) experiences qualitatively different. Studying women's experiences inherently means engaging with the body and its processes of menstruation, pregnancy, lactation, and menopause. Second Wave feminism made possible this initial shift in focus, and Third Wave feminism expanded it beyond the gender binary. This led to a greater acceptance of and focus on embodiedness and the body in many other aspects of the study of culture and expressive culture.

In many disciplines, interest in the body was not new. In education, one participant commented, the body has always been considered, although sometimes ignored "…in favor of cognition." Another participant suggested that the alignment of the right people at the right time or "…a series of independent events that have begun to permeate the larger group mind" might be responsible, rather than any new interest per se.

The list of challenges confronted when engaged in body-related research was significant. While many of the issues cited were specific to a particular project, a number of responses fell into the broad categories of conceptual, physical, social and funding challenges when future projects were considered. Conceptual challenges included the idea that the physical and mental are separate and do not affect one another, that movement does not relate to learning, and a general expectation not to move. The range of physical challenges were quite broad, and included a lack of awareness or discomfort with the body. Challenges in the social domain included issues related to privacy and observation, cultural or community acceptance of new ideas related to the body, body image, disability, taboos, and the "…delicate nature of the traumatized."

Funding for future projects was identified as a particularly difficult hurdle because "…large scale human research is expensive and challenging," and we are often "…exploring

new ways of knowing and being that do not fit into the scientific model." The lack of empirical evidence showing how embodied practices lead to neurobiological changes also contributed to the continued lack of funding and appreciation of this work. As one respondent noted, "Scientific culture and various bodywork fields do not converse enough, there is a cultural, conceptual and linguistic gap between the academic experts and the non-academically trained practitioners."

At the heart of this research was an interest in understanding the range and expanse of what interdisciplinary participants considered the most significant areas for current and future inquiry related to the human body and its movement. An overwhelming majority identified the exploration of the mind as it relates to the body. This included further research in mindfulness, consciousness studies, the generation of meaning, identity, agency, anxiety, trauma, emotion (or "affect"), dementia, neuronal degeneration, continued research in neuroscience, optimal or accelerated learning, and eco-psychology. It was noted that while "There have been countless studies on meditation and brain functioning," far less has been done on the body in motion.

There were also a number of responses related to physical health and wellbeing. These included the study of aging, pain science, immunotherapy, cell modification, infectious disease, motor symptoms in Parkinson's disease, massage and movement in recuperation from surgery, and the relationships between movement and healthy living. Future inquiry in the domains of art and aesthetics included exploring the physical changes that arise from the use of technology, for example drawing on small computer screens, and using biometrics to identify "…what happens to our brains and bodies when we encounter art." Social areas for research included how the social-affective context interacts with bodily processes, interpersonal communication, ethics, eco-criticism, and identities, which is noted above under the mind but also has a social factor.

One particularly potent response in the social arena described the body as "war theatre" for the practice of humiliation, such as profit-driven manipulations to the body.

Technology related topics included the perception of movement, the body's relationship with technology, such as UX and haptic studies, and online interfaces for body-mind education. Haptics studies the sense of touch and motion that are generated through a computer interface, and UX refers to user experience of computerized technologies. Design questions included designing experiences, often but not exclusively the design of experience in educational settings, and how these might be radically reimagined.

A few comments pointed to less common areas of exploration or expansion, including work with non-normative bodies, how to effect consciousness through touch, and movement in mobilities theory. Mobilities theory studies the implications of the movement of people, things and ideas. One participant from the field of geography wrote: "I consider movement as a means of rendering knowledge that precedes social and cultural denotations." Another astute observation, made by a participant working in the field of dignity studies, was that "Dignity is a posture," or as philosopher Franz Josef Wetz put it, an "orthopedic challenge."

Also worthy of note were a few comments from participants who indicated the body was of very little importance to their field. These comments related to specific challenges in their work that, from the perspective of movement experts, could be considered in direct relation to the body. These included leadership training for college students in the communication industry, social psychology related to the objectification of bodies based on gender and race, concerns about human impacts and behavioral change in relation to oceanographic research, and immunotherapy in which the body was not studied and "…not really deemed that important to this work." These are intriguing comments that will be addressed in the following chapter.

Interdisciplinary Participants' Perception of Body-Mind

Interdisciplinary respondents' awareness of their bodies ranged from quite unaware to an ongoing and refined awareness. Thirty-seven of these participants were most aware of their bodies when exercising, or in some other specific activity, such as meditation or teaching. Twenty-seven respondents connected the time of day (often first thing in the morning) with being most aware of their bodies, while fifteen individuals said they were aware of their bodies throughout the day. Another fifteen respondents were most aware of their bodies through the discomforts of pain, fatigue, hunger, etc., although three participants admitted to feeling pretty disconnected from their bodies in general. Sitting at a desk too long and working on the computer led to not only discomfort, but also disconnection from the body. One participant was most aware of their body when their 'fitbit' signaled them. These outcomes are displayed below in Table 6.

Table 6

When Interdisciplinary Participants Were Most Aware of Their Bodies

Percentage	When Most Aware of Body
37	While engaging in specific activities
27	At a specific time of day
15	Consistently throughout the day
15	When uncomfortable
3	In specific environments
3	Pretty disconnected

What was particularly noteworthy here was what is, in large part, absent: only a few respondents noted feeling more aware of their bodies in relation to other people, or in relation to their environments. Only three respondents said they felt most aware of their bodies in specific environments, like being in nature or in a new space. This included one person who was very

aware of their body whenever they went outside because, they noted, they were "hijabi muslima" in France, which means they wore a hijab or head covering.

Amongst those who were more aware of their bodies while engaging in specific activities were three respondents who mentioned their relationship with other people while teaching, conversing with gestures, and working with patients. One of these latter respondents noted being particularly aware of their body while paying attention to their breath "…as anxious patients will mirror my breathing often and calm down." This comment is particularly appreciated because it is the kind of knowledge we have *through* our bodies and our lived experience that is often integrated and used, but often not consciously.

What no one mentioned at all was feeling more aware of one's own body while in physical contact with another living creature, like petting an animal, caressing a child, hugging a friend, or having sex with a partner. The obvious question that arises here is, "Why not?" Another question, which was not asked, that might have lent more insight into these responses was, to what *depth* participants were aware of their body on multiple levels, such as the physical, emotional and cellular levels.

In an attempt to gain a sense of respondents' awareness of their own body-mind complex, participants were presented with a body schema, and requested to indicate where they felt their mind was located. A strong majority of participants (54) included the region of the head, with 35% of these responses identifying the mind residing exclusively in the area of the head. Table 7, below, lists the general outcomes of this inquiry.

Participants' responses provided some interesting variations that included symmetrical combinations, such as both arms and hands, or complex combinations, such as the head, navel, space above and surrounding the head and torso, and to both the right and left sides of the body.

Asymmetrical combinations were also selected. For example, one respondent included the head, chest, hands, feet and the space surrounding the body to its upper left side as the location of mind. Another intriguing asymmetrical combination included the head, chest, legs (but not feet), the right arm (but not hand), and the space next to the body alongside the right leg. The original body schema and a few examples of some unique participant responses can be found in Appendix D.

Table 7:

Where Interdisciplinary Participants Felt Their Mind Resides

Body Region	**Number of Responses**	
Head	54	35% of these chose head only
Chest	30	10% of these chose chest only
Hips	29	
Extremities	21	
Spaces Beyond Body	10	

One participant commented: "Which mind? The analytical mind, or the experiencing self? The first," they continued, "in the head, the second mostly around the area of the heart, with a deeper, more intuitive, wise part deep in the abdomen, around the viscera." Another respondent noted the influence of philosophical discourse suggesting "…body, mind and environs as relational complexes." Another person described in precise detail their perception of the mind as "A hand connected by nerves to an eye that is connected by nerves to a brain." These responses raised the question of the difference between this sense of mind being derived from lived experience, from the inside-out, and those that arise from exterior ideas or conceptualizations, or from the outside-in. This question falls beyond the scope of this study, but would be an interesting direction to pursue.

Another question probed into participants' understanding of the relationship between mind, body and environment, with a prompt to select from a group of images the schema they

felt best represented their perspective of this relationship. Out of nine images, three were selected most often (see Figure 5, below). These were Image 4, selected by 30% of participants, Image 9, selected by 18% of participants, and Image 5, selected by 14% of participants. A copy of the original nine images can be found in Appendix E.

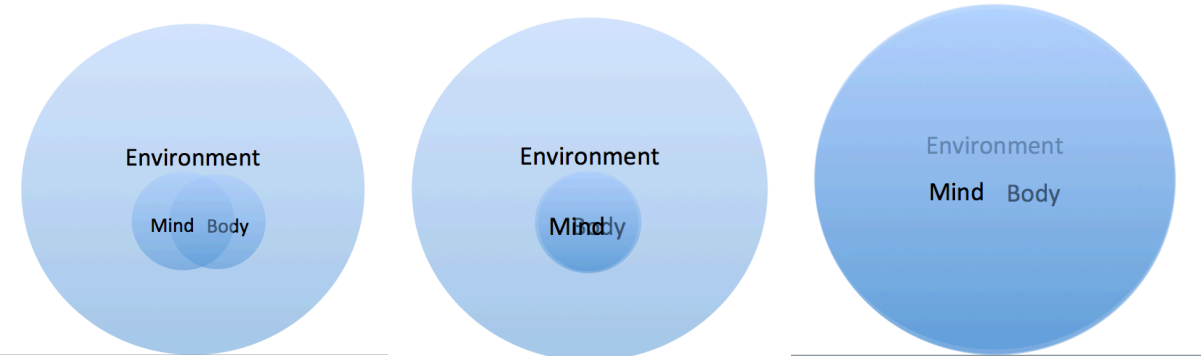


Image 4
30%

Image 5
14%

Image 9
18%

Figure 5: Body-Mind-Environment Schema, top three choices of interdisciplinary participants.

Movement Expert Surveys

The original intention in creating the survey for movement practitioners was to offer an opportunity for movement experts to reflect upon the knowledge and abilities developed over a lifetime of movement-based practice. Because movement-based practice relies primarily on experience for the acquisition of knowledge, skills and capabilities, often without language to explicitly identify any of these, it is possible that movement practitioners, even at the expert level, are not aware of all that they might 'know.' The response from this community and their willingness to share their knowledge and experience was overwhelmingly supportive, and deeply appreciated by the researcher, particularly given the length of this survey.

Self-Assessment of Skills, Abilities and Capacities

In an effort to consider domains of knowledge, skills and capacities common among movement practitioners, and potentially related to movement-based practice, participants were

asked to rate some of the skills, capacities, and abilities they felt they had developed on a scale of zero to five, with five representing a strong level and zero representing none. Whether or not these skills, abilities or capacities might align in causal relationship with movement-based practice could not be clear from this exercise. Nevertheless, it seemed possible that this information might prove informative, or suggest areas or directions for further investigation.

The skills or capacities queried were grouped under six headings, though many of these could have been classified under more than one category. Category headings were: 1) Enhanced Awareness, 2) Personal Skills, Capacities and Qualities, 3) Interpersonal Skills and Abilities, 4) Creative Skills and Abilities, 5) Organizational Skills and Abilities, and 6) Movement and Physical Skills. For readers interested in viewing participants' self-rating on these skills and capacities from strongest to weakest within each category, please see Appendix F.

Enhanced Awareness

There was an all-around strong response in self-rating in the first category, Enhanced Awareness. All types of awareness proposed within this category resulted in a mean average rating of 4.0 or above. The types of awareness with the highest mean averages, all above 4.5, were physical, spatial, sensorial and internal awareness, along with a strong awareness of bodies in space. All but one respondent said these levels of awareness carried over into their daily lives.

In this same category, participants were asked to identify up to three types of awareness that they found most important or useful in their daily lives. The top three selections in response to this question were being aware of dynamics in relationships, spatial awareness, and awareness of internal states. There was not a direct correlation between what participants felt they were good at, and what they valued or deemed most useful in their daily lives (see Table 8, below).

Table 8:

Enhanced Awareness Most Important in Movement Experts' Daily Lives

Type of Awareness	Number of Times Selected	Self-rated Average Mean
Relational Dynamics	30	4.35
Spatial	28	4.65
Internal	27	4.54
Sensorial	26	4.64
Physical	25	4.68
Emotion in Relationships	24	4.20
Invisible or Subtle	15	4.24
Contextual	13	4.18
Temporal	12	4.09
Environmental	11	4.29
Bodies in Space	10	4.67
Layered Attention	8	4.16
Gravity	4	4.40
Relation Between Viewer & Viewed	2	4.33
Formal Relation	2	4.06

In space allowed for comments concerning sensorial awareness, a number of respondents added sound, tone and voice, and commented specifically on the sensation of the vibration of sound. Touch was also identified by many as an important factor in communication, and for guiding or facilitating change. Under bodies in space, participants commented on their awareness of the relationship between posture and circulation, breath, and health, postural tone, and being able to read the posture of others. Kinesthetic awareness was connected to an ability to anticipate and predict the movement of others. Under the broad topic of the awareness of relational dynamics, respondents noted a hyperawareness of movement, strategic positioning, character expression, and cultural dynamics expressed through sexuality, gender, or multi-cultural associations. Furthermore, being aware of choice in movement, attention, and emotions was noted, along with the creation of meaning within contexts, and the value of awareness of the early warning system of the fight, flight, or freeze response.

Personal Skills, Capacities and Qualities

Participants' self-ratings concerning personal capacities ranged overall from an average of 3.81 and up. The two categories that rated above an average of 4.5 were the willingness to learn, and reliability. When asked to identify up to five personal skills, capacities or qualities that had the most significant effect in their lives, participants selected compassion, intuition, adaptability, self-regulation, and resilience most often. See Table 9, below for a more detailed analysis in this category.

Table 9:

Personal Skills, Capacities and Qualities Most Significant in Movement Experts' Daily Lives

Type of Skill, Capacity or Quality	**Number of Times Selected**	**Self-rated Average Mean**
Compassion	26	4.30
Intuition	26	4.45
Adaptability	24	4.47
Self-discipline or self-regulation	22	4.21
'Resilience'	21	4.31
A positive attitude or outlook	21	4.06
Focus and Concentration	18	4.31
Curiosity	18	4.48
Grit & determination (willpower)	17	4.34
Integrity	17	4.44
Willingness to learn	14	4.54
Ability to meet the unknown with relative ease or creative response	13	4.20
Ability to tolerate ambiguity & uncertainty	13	3.81
Critical thinking	13	4.24
Courage	12	4.14
Comfortable in front of an audience	12	4.34
Reliability	11	4.51
Solution orientation	10	4.23
Confidence	10	3.99
Comfortable with change	9	4.14
Mental agility	8	4.24
Ability to manage one's own strong emotions (emotional stability)	6	4.01
Comfortable making decisions	5	3.98
Ability to perform or stay focused under pressure	3	4.18

Participants noted that they also valued authenticity, pragmatic process orientation, patience, kindness and generosity, humor and playfulness, visual and spatial memory, and the ability to see or feel beauty in all people and places.

Interpersonal Skills and Abilities

Among interpersonal skills and abilities, self-assessment ranged upward from an average of 3.5. Those ranked highest in this category (4.0 to 4.5) were nonverbal communication skills, emotional intelligence, physical empathy, deep listening skills, psycho-physical intelligence, team building, the ability to create or communicate meaning, to motivate or inspire others, and to communicate comfortably with diverse types of people. Noting the five most useful skills or abilities, participants selected nonverbal communication, deep listening, the ability to communicate comfortably with diverse types of people, to motivate or inspire others, and to create or communicate meaning. See Table 10, below, for more details.

Table 10:

Interpersonal Skills and Abilities Most Useful in Movement Experts' Daily Lives

Type of Skill or Ability	Number of Times Selected	Self-rated Average Mean
Nonverbal communication (reading & expressing)	27	4.39
Deep listening	26	4.17
Ability to communicate comfortably with diverse types of people	20	4.32
Ability to motivate or inspire others	20	4.33
Ability to create or communicate meaning	19	4.34
Empathy	18	4.40
Emotional intelligence	16	4.30
Team building	10	4.02
Ability to respond constructively to others' strong emotions	8	3.95
Psycho-physical intelligence	8	4.12
Conflict resolution	8	3.53
Ability to respond to constructively to inappropriate behavior	7	3.57
Physical empathy	5	4.22
Consensus building	4	3.72
Negotiation	4	3.52

Interpersonal skills and abilities identified that were not already on the list provided were consistency, conscience, and knowing when to back off. While not requested, a number of respondents commented on areas they wished to improve upon, which raised the possibility that many of them also possessed the personal quality of humility.

Creative Skills or Abilities

Participants' self-rating of their creative skills or abilities ranged from an average of 3.5 and up, with creativity/ingenuity at an average of 4.56, and communicating through the body at 4.59 at the top of the list. The five creative abilities participants' identified as most useful in their lives were imagination, thinking 'outside the box,' improvisational facility, creativity/ingenuity, and the ability to give constructive feedback. See Table 11 below.

Table 11:

Creative Skills or Abilities Most Useful in Movement Experts' Daily Lives

Type of Skill or Ability	Number of Times Selected	Self-rated Average Mean
Imagination	27	4.48
Thinking 'outside the box'	25	4.39
Improvisational facility	25	4.43
Creativity or ingenuity	23	4.56
Ability to give constructive feedback	23	4.38
Ability to receive (constructive) criticism	20	4.00
Ability to communicate or express through the body	18	4.59
Ability to decipher meaning, sense or order	16	4.31
Ability to design experience	16	4.22
Musicality	15	4.20
Use of imagery	11	4.35
Use of metaphor	9	4.17
Rhythmic coordination or organization	8	4.11
Ability to convey a story	8	3.97
Ability to discern or predict possibility	8	4.08
Artistic expression	7	4.38
Abstract expression	5	4.19
Spatial design	5	4.03
Formal design (shape)	2	3.72
Temporal design	1	3.74

Additionally noted were the creative abilities to recognize the larger whole and context, embrace complexity, and to see and appreciate beauty, which was also, quite appropriately, added as a personal ability. Simplicity, deep observation, receptivity to the collective unconscious, and attunement to cross-disciplinary analogies and collaboration were also added to this list.

Organizational Skills and Abilities

Self-assessment on organizational skills and abilities was lower overall than any of the previous categories, with skills ranging from 2.94 to a 4.45 average mean. The strongest organizational abilities, ranging above an average of 4.0, were goal-orientation, solution-oriented problem solving, the ability to meet deadlines successfully, and to identify root issues or problems. The only element rated below 3.0 average mean on this survey was marketing. When asked what they considered the most useful or significant skills in their lives, participants identified time management, the ability to prioritize, and multi-task. See Table 12, below for a more detailed analysis.

Table 12:

Organizational Skills and Abilities Most Useful in Movement Experts' Daily Lives

Type of Skill or Ability	Number of Times Selected	Self-rated Average Mean
Time management	30	3.97
Ability to prioritize	26	3.96
Multi-tasking	19	3.67
Goal orientation	18	4.04
Ability to meet deadlines successfully	14	4.45
Solution-oriented problem-solving	13	4.07
Ability to identify root issues or problems	12	4.06
Production management	11	3.83
Ability to assess strengths & weaknesses	10	3.93
Ability to delegate responsibility	9	3.44
Marketing	9	2.94
Event management	9	3.92
Process management	5	3.74

Movement and Physical Skills

Movement and Physical Skills were situated last in this series of questions. Self-assessment on these skills ranged from an average of 3.68 to 4.51, with only physical intelligence rating above a 4.5 average mean. The three most noteworthy skills among these in participants' daily lives were psycho-emotional health and wellbeing, overall physical health, and physical intelligence. Please see Table 13, below for more details.

Table 13:

Movement and Physical Skills Most Useful in Movement Experts' Daily Lives

Type of Skill	Number of Times Selected	Self-rated Average Mean
Psycho-emotional health and wellbeing	31	4.23
Overall physical health	24	4.11
Physical intelligence	24	4.51
Movement literacy	18	4.37
Coordination	17	4.22
Balance / steadiness	14	4.07
Strong immune system	12	4.04
Strength	11	3.94
Stamina	10	3.68
Physical agility	9	3.98
Flexibility	9	3.89
Movement efficiency	9	4.22
Physical articulation	6	4.27
Movement precision	5	4.12
Control	2	3.98
Cardio-vascular health	1	4.14

Comments on additional physical skills or abilities included alignment, physical ease and joy in movement, flow states, nervous system health, resistance to pain, physical and personal efficacy, sleeping well, and a "…totally enhanced experience of intimacy."

It is worth highlighting here that 75%, or 67 out of 89 of these movement experts and professionals were over the age of 45, and one-quarter of *this* group or 16 participants were between 68 and 84 years old. The challenge and absurdity of trying to rate oneself for these abilities at age 72 was duly noted, and appreciated. Another participant, whose comment was

appreciated for its accuracy and good humor, criticized the lack of a scale for comparison, noting:

> I rated myself strong and flexible (4) though I do not have the strength of an ant or the flexibility of a cat. I have been stronger in my life than I am now, but given the tool I have, it's strong enough to lift someone almost a hundred lbs. heavier and swing a child around over head using good technique.

Certainly, the responses and comments from this group of movement experts demonstrated their humor, rigor, generosity, and ability to give constructive feedback effectively.

Awareness During Movement Practice

Another series of questions attempted to understand what movement experts were aware of while they were engaged in their movement practice. These questions were grouped into categories of awareness on the levels of body, movement, sensation, and surrounding environment. Over 70 participants noted being aware of balance and spatial relationships on a body level, energy on a movement level, flow and sound on a sensory level, and awareness of others directly involved in the movement practice in relation to the environment. Detailed tables summarizing these responses can be viewed in Appendix G.

A large majority or 88% of respondents were also directly or indirectly aware of their own emotions while engaged in their practice, and 73% indicated that they were aware of the emotions of others while moving. Further, 78% were either directly or indirectly aware of imagery relevant to the task at hand, with 55% aware of imagery not obviously or directly related to the task in which they were involved. One participant commented: "…it really depends on the moment, the place, the people... imagery is a combination from the inside and outside perceptions."

An overwhelming majority or 94% of respondents noted being either directly or indirectly aware of insights, intuitions, or revelations while engaged in their movement form or

practice. A number of participants described these as "aha! moments" which included self-knowledge, relational and creative insights, trans-generational information, insight into unity of purpose, enriched understandings of the nature of reality, and information coming from "…a source of wisdom not located in the sphere of me or mine."

Movement Expert Participants' Perception of Body-Mind

As in the Interdisciplinary Survey, the movement experts were asked to indicate on the human body schema provided (see Appendix D) where they felt the mind resides. A strong majority, sixty-five participants, included the region of the head, with almost one-quarter of these identifying the head alone. Twenty-three respondents felt that mind resides throughout the entire body, and nine participants indicated the mind was present everywhere. The seventeen remaining participants who selected the head also added other regions of the body, or space surrounding the body as the location of the mind. One common combination, for example, was the head, heart, and hands. One unique response identified only the space around and above the head. Please see Table 14, below, for more detail comparing movement experts' responses with those of the interdisciplinary participants.

Table 14:

Where Movement Expert Participants Felt Their Mind Resides

Body Region	**No. of Responses Movement Experts**	**No. of Responses Interdisciplinary Participants**
Head	65 24% of these chose head only	54 35% of these chose head only
Chest	60 18% of these chose chest only	30 10% of these chose chest only
Belly and/or Hips	48	29
Extremities	38	21
Space around the Body	17	10

One movement expert succinctly stated, "The 'mind' is our awareness of self." Another participant said they found the mind could be anywhere in the body that they chose to focus. One

person commented that their sense of where the mind resides had shifted with age and a decrease in movement, writing that it "…used to be more my feet and legs but now more shoulders, head and placement of my head." Another participant described "…a 8 figure. Lower part passing through the heart center. Crossing at the Thymus Higher part passing through the head. It is not a static location but more a current/flow…" All of these responses suggested an understanding of mind that is dynamic, relational, and in the first three instances, with a capacity to shift location depending upon one's focus or the patterns of movement practiced regularly in one's life.

The experience or understanding of the mind residing within the entire body was identified by 24% of movement experts, in contrast to 12% of interdisciplinary participants. The conception of the mind residing everywhere was selected by 9% of movement experts, and by 7% of interdisciplinary participants. Asymmetric combinations were indicated by 5% of movement practitioners, in comparison to 8% of interdisciplinary participants.

Movement experts, like the interdisciplinary participants, were asked to select from the series of nine images representing possible relationships between mind, body, and the environment. The three most popular images can be seen in Figure 5, presented earlier in this chapter. These were the same images selected by interdisciplinary participants, although the sequence of prioritization was different, as shown in Table 15 below. A copy of the nine original image choices can be found in Appendix E.

Table 15:

Comparison of Top Three Selections of Body-Mind-Environment Relationship

Image No.	**Movement Expert Participants Percentage**	**Interdisciplinary Participants Percentage**
4	24	30
5	25	14
9	20	18

Movement Expert Participants' Perception of Value

Participants were asked a number of questions relating to how they perceived the value of their work, and what they admired in the work of their peers. When asked what they considered the most important or valuable contribution their discipline or field brought to the world, participants identified wholeness, body-mind integration, life skills, creativity and innovation, and remembering our common humanity. Foremost, movement practitioners identified reconnection to one's self, humanity and nature, or wholeness, with "…[a] recognition of what it means to be human." These comments also referred to presence, awareness, and maintaining a balance between thinking, feeling, sensing, and doing. One participant stated, "I think it is a pragmatic example of process philosophy: embracing change, dynamism, systems, ambiguity, ephemerality, wholeness, etc."

Body-mind integration was also considered a valuable and important contribution, reminding us of our "…material fleshy real-ness… [with a] requirement to actually consider the ephemerality of life (where dance is a powerful metaphor for such), as a good thing...." Individual life skills were also identified as an important contribution that their movement-based practice provided. These included tools and experiences for both physical and emotional health, communication, self-knowledge, self-regulation, empathy, resilience, and agency. Creativity and innovation were also cited as valuable contributions, along with helping others make new choices and interrupt habitual patterns. Connecting to and creating community in our shared humanity by recognizing our interconnectedness and interdependence were also identified as important and valuable contributions made through this work.

Movement experts participating in this survey were asked to identify qualities in their peers that they most admired or respected. Responses included humanness, dedication, a

beautiful mind, creativity, authenticity, and mastery in their work. One participant commented, "I love how some people can tap into the most important issues of what it is to be human, through what seems like play...." Dedication was noted by many, and described in more than one form, such as dogged determination, commitment, perseverance, tenacity, willpower, devotion, resilience, and discipline.

When discussing the minds of their peers, the movement expert participants expressed admiration for their colleagues' intelligence, rigor, depth of understanding, and adventurousness. The creative capacities of their peers were also much admired, as were humor and playfulness, joy and passion, courage and risk-taking. "It takes a lot of courage to break the norms of our society and create a new culture. After all…humans are a herd animal…." Authenticity, simplicity, integrity, humility and acceptance of the unknown were also valued, as was "mastery and perfection."

The sense of feeling isolated, unrecognized, and unappreciated highlighted the deep need for community, and for recognizing and giving language to the value of what movement practitioners and experts do. Finding appreciation from those outside of the field of movement practice can be particularly difficult, because what movement practice contributes is not only experientially transmitted, but also subtle, and multi-layered. One respondent commented that they had no peers in their city. "I often feel like I am working in a vacuum. Sometimes I feel very close to giving up."

Some movement experts wanted those outside their field to understand that the sensory-kinetic system "…is the foundation for our understanding and interaction with the broader physical and social world." Movement expert participants also wished others understood "…that we have and are a body and that there are multiple ways of knowing, all of them stored within

the body." Another believed that having "Faith in the possibilities embodied by the members of the group" was a valuable understanding that movement practice, such as improvisation, could offer. Finally, one movement expert wished, "…others understood the deep intelligence of dancers, and…that dance could disrupt academia's tendency to privilege linguistics over embodied language. I want others to understand, or at least appreciate, the power and value of our knowledge."

Interviews

Eleven interviews were conducted for this research with the aim of expanding, deepening, or refining the researcher's understanding of body studies outside the frame of movement practice, or performance. Identifying possibilities, concerns, types of research, and issues at play concerning the body, or body studies today was also of interest. These interviews included perspectives from dance education, somatics, interdisciplinary dance studies, technology, neuroscience and phenomenology.

Dance Education #1

One dance educator, Rima Faber, had a strong foundation in American modern and post-modern dance with early training from Anna Sokolow, Martha Graham, Merce Cunningham, and Bennington College, with later influences from the Judson Church group, Gestalt psychology, yoga, somatic practices, Buddhism, and Hawaiian shamanism. Understanding how the mind works in relation to the body in both dance and life was a driving interest for Faber, which led her to reject, select, embrace, and integrate from among these diverse schools of movement, thought, and practice.

The work with Graham gave an understanding of dance as a "…symbolic language of the body," and the ability to express movement in imagery, to connect dance to intellect, and to

experience the body as a metaphor of art and life, and thus be able to read a person through their movement. Cunningham embodied a way of "…liv[ing] in beingness" with humor and a sense of irony, which this dance educator found deeply beautiful. An interest in developmental cognition was sparked from the first class in developmental psychology at Bennington College which embarked with: "Babies don't have language. They don't talk. How do they think?" These threads merged into an understanding of dance as "…an expression of who we are and what we live," with the body as a metaphor of the universe. This approach was reinforced by studies in shamanism. Exposure to Buddhism proffered an understanding that space, time and energy are not separate, and that the components of dance education (creating, performing, responding to dance, and connecting dance to meaning) are enacted simultaneously as we dance, choreograph, and learn.

"The body is the core for us, from infancy through adulthood," Faber stated. From this person's perspective, Piaget's work is viewed not as "…separate stages, but as layers, the way a tree will grow or how an onion has rings." One retains the previous stages and an awareness of them, so even when moving into the realm of abstraction, the body remains at the core. When you don't have this kind of depth and simultaneous fullness, she commented, "…you are missing the connections between things… We are not an isolated entity." This is true, she continued, "…of our being in the world and our being in the body." When we focus on one element in isolation, a body part for example, we end up compensating or distorting some other part of the body, which ends up being injurious rather than useful.

This dance educator's teaching philosophy focused on this wholeness and simultaneity, not escaping reality, but dancing about real life experiences and issues. In this approach, students are allowed and encouraged to explore each part of the body, how it connects and what it means

in terms of function, communication, and what it feels like. This approach educates students to not only understand the many possibilities of movement our bodies allow, but also to feel their interrelationships in all their complexity, and experience why they relate. In very broad terms, Faber's aim was to help students experience and understand the inherent logic of the body itself.

Somatics #1

Another person interviewed, Amy Matthews, was a somatic practitioner and educator, with long experience in Body-Mind Centering®, Infant Development Movement Education, Rudolph Laban and Irmgard Bartenieff's bodies of work, dance, yoga, and the martial arts. While recognizing that embodied practice is "…getting at something about valuing our flesh that has been dismissed for a long, long time," Matthews also raised the question, "What do we mean by embodied?" If we mean, "…having flesh" then "…every body is embodied." Every baby that enters the world is embodied, but they are not graceful or skillful, and they can be downright awkward, and do things that "…look really uncomfortable. But they persist, and they learn from it." She wondered if the large numbers of dancers who work in embodiment or somatic work have influenced what she sees as a possible trend to connect what embodiment looks like with what might better be defined as dance skills, such as grace or presence.

Matthews also warned against the assumption that someone is not embodied just because their body does not "…speak or *move* in our language." The expressive ability of the body is not the same for everyone, she pointed out, and while it can be taught, it may not necessarily be instinctual. As dancers, we might assume our map of embodiment is accurate, and while "Our vocabulary for experience is highly developed, and very sophisticated," this somatic educator did not believe it correlated with right or wrong. It is important to "…keep recognizing that the maps are not showing what is. They are showing someone's perspective of what is. And that

perspective is an expression of their values and intention." Given the subjectivity of our experience, Matthews encouraged inquiry and curiosity by asking what is the other person's "…understanding of what they are doing?" It is important, she believed, to recognize "…how deeply we are embedded in our own patterns and values."

From Matthews' perspective, what we value becomes what we practice, and what we practice establishes habits of thought, which are expressed by and through our patterns and habits of movement. The impact of other people on these patterns is enormous, and evident in work with babies. Within days of entering of the world, this educator said, babies begin to "…set up rhythms with their caregivers" as they figure out how to get positive responses to their needs. This includes patterns of behavior based on communication through tone of voice, how the baby is handled, the sense of approval, and the palpable sense of whether the presence and attention of the caregiver is conditional or not. These patterns of interaction are foundational to the basic strategies and patterns of relationships we learn throughout our lives, from our caregivers, families, communities and cultures. The contextual aspect of this cannot be ignored.

Personally, Matthews valued the ability to move and express what she feels, and to recognize movement habits and change them, which she saw as connected. Matthews pointed to the tendency to choose what is familiar over what is unfamiliar, even when it is uncomfortable or not really working for us. She encouraged exploring "…the intersection of comfortable-familiar, and uncomfortable-unfamiliar," and how we might find comfort with what is unfamiliar, and feel the discomfort in what is familiar. Caregivers interacting with their babies, for example, might begin to use of the terms familiar and unfamiliar, instead of liking and disliking.

Clarifying our language, and asking people what they mean, rather than assuming that we know, is a political action, Matthews observed, as is really listening to their experience, rather

than assuming we know what they need. “We have to recognize that we are not having the same experience, and we might be using the same word for two different experiences, or we might use two different words for the same experience….” Honing in on one common language around embodiment was not necessarily called for, she felt, because “…that becomes normative in some way,” imposing, ultimately, a *right* way to do it. “…[T]aking on the exercise of the subjectivity of language,” while certainly a lot of work “…is actually going to do more for helping me comprehend your world, and you comprehend my world,” and in this way, to stretch our ideas and our understandings.

Somatics #2

Another perspective from somatics was offered by Mark Chandlee Taylor, a practitioner who worked with Bonnie Bainbridge Cohen’s Body-Mind Centering® and Peter Levine’s Somatic Experiencing. Previously a choreographer, Taylor observed a continuum in the healing aspect of embodied movement, from performance to hands-on work. For example, presenting choreography in the 1990s with women lifting men was a way to encourage audience members to recognize and possibly alter culturally ingrained assumptions. In hands-on somatic work, the relationship to healing is more direct, yet “On some scale it is all the same work.”

Taylor commented that the world today is still immersed in the cultural “…fiction of rational behavior,” and that dance is interestingly positioned to go in either direction, where “…the thinking mind can superimpose itself,” for example, as we strive for technical prowess, or where mindful practice allows access to the different expressions of intelligence within the body. This is not the same as Howard Gardner’s multiple intelligences that are associated with the thinking mind, but rather refers to other types of intelligence, such as the element of awareness that is present in “…every cell, every tissue, every organ.” Taylor worked regularly with these

different intelligences, such as the intrinsic brain of the heart, the intrinsic brain of the gut, and the interaction of the autonomic nervous system with the immune system and the endocrine system. "All of these systems are functioning as centers of intelligence." While the gut brain lets us know if we are safe or not, and the heart brain engages in the relational field, when these two are functioning smoothly, the role of the head brain is to respond "…creatively to new stimuli in the environment."

> The challenge and gift of our field is that you cannot understand what embodiment is until you experience it. And as much as we try to language it, the language just gets more and more murky. So I have learned to try to talk about the results, the effects, rather than trying to describe what it is… Once you've been there…there is a knowing from an embodied perspective…Spoken language, written language is insufficient to express the practice that we engage in.

The significance of enabling a kind of communication or transfer of information that is not spoken or written, as we do in embodied practice, Taylor said, is that "It is a non-religious, non-sectarian, apolitical act that brings balance…" not only to the gut, heart, head configuration but also to the environment. Like Harari, as noted earlier in this thesis, this somatics expert also believed that:

> **…**the pace of the development of technology has outpaced our abilities to develop as a species … we understand that we are killing ourselves by killing the earth and we still do it. So there is this appetite that is out of control, and I feel that when we embody ourselves, there is no choice but to become aware of the effects of your actions on other people, other beings, the planet. I do not know of a person who does this kind of work who is not also working on compassion, at least [having] a minimal… commitment to social justice, to positive change…."

While somatic movement education and therapy identifies itself as a "…so-called new profession, we have roots that go back thousands and thousands of years" to what are essentially wisdom traditions. Many of Taylor's students come from the psychotherapy and counseling professions, and are searching for something that seems to be missing in what they have been taught or are practicing. Our reactions, patterns of thought and behaviors are caused by imprints

on the body. The impact of the developmental movement work, which is foundational to many somatic approaches, is the ability to track the developmental patterns that support speech, vision, hearing, cognition, global integration, etc. **"**We see that when kids are robbed of movement… they don't develop, and movement, organizing movement, helps them develop."

In response to the question, "If you were seated in some space where you could look out onto all of humanity, and you could gift them with one thing, what would that be?" Taylor responded, "Acknowledge your suffering… This is the first step, to acknowledge our discomfort – what we need, what we are holding, what is limiting us." This is the first step, which is followed by many others.

Dance Education #2

Another dance educator who agreed to be interviewed, Doug Risner, was a university dance professor who has done extended research in the social dimensions of dance, particularly related to gender and race. When we think of how we are taught, we usually think of a classroom with a single teacher, Risner said. We are often unaware of how "…our body is taught and trained… through social and cultural messages," such as what our body is supposed to look like. This educator highlighted "…how highly gendered that is."

One particularly powerful element in Risner's work was a perspective on death that aligns with dancer's familiarity with ephemerality, of the medium itself but also of the process of repeatedly shedding identities over a lifetime. This individual was diagnosed with late-stage cancer five years ago, and was not expected to live. Since that time, Risner's practice has been learning "…to die well." Dancers, particularly those who choose to continue beyond the years of professional performance, are constantly "…living these demi-deaths."

Many dancers have what feels like an ongoing conversation with their bodies, which can help to bring unconscious layers of experience into awareness. For many years, Risner used free improvisation as a way "…to internalize, translate, [and] make sense of" lived experience. Risner found that externalizing feelings by getting them out into the studio space in movement helped to feel them better, and while this process did not provide answers, "…it often helped me move forward in my thinking." The interviewee believed this kind of "…relationship with our body is really quite different than the traditional western view of the body as a thing, and something that has to be managed, or has to be thinner, or heavier or taller, or whatever the current fad is." There was also concern that people's lack of "…real connection to their body itself, and listening to what their body is telling them" is at the root of "…this huge mental illness thing developing throughout the world and people…are not understanding what that is."

Today, Risner's body helps to bring awareness to how much medication it can handle, or how much stress is too much. This type of awareness lays down clear choices about things one has control over, like whether it is more stressful to painstakingly edit an upcoming book, or to have someone else do it. It also helps deal with trade-offs in situations where one has much less control, like quality of life issues when battling cancer. "I could take as much [medication] as they have prescribed each day, but I don't. The cognitive dysfunction and delay, especially with my oral chemo, I can really feel it."

Risner commented on euphoric states of the creative process, and the few special moments in a performing career "When you go to that place where there was no difference. You weren't a dancer. There wasn't a dance." The experience where there was just that moment, fully alive. The ephemerality of the dance is its magic, Risner believed. "Why would we ever want to

repeat that performance anyway? That is why you perform." To see "What is going to happen this time?"

This attitude toward the unknown, and an ephemeral, moment-to-moment of existence is not the norm in the western world today, and yet, over the last sixty years in the field of dance, the body "…has really gone through major changes… We are so much healthier. We are so much more in tune with our bodies. We have so many other people who are studying us and our bodies. There are many more people studying us outside of dance than inside dance."

Interdisciplinary Dance Studies #1

Another person interviewed, Scott deLahunta, was a dance-based researcher at a cutting-edge university dance-research group in England, where he is exploring interdisciplinary research and collaboration. DeLahunta has spent the past twenty-five years immersed in questions surrounding the claims that can be made for what dance practitioners know through "…skillful bodily practice." This researcher has been among the foremost players in interdisciplinary exchange with fields that include technology, anthropology, psychology and neuroscience. DeLahunta acknowledged the value that can come from collaborating with those in other, institutionally respected fields, as well as aligning with well-known artists, such as William Forsythe.

Some of the social anthropologists this educator has worked with have done their fieldwork in places where valuing ways of knowing based on bodily, material practice, or craft, is very different from in the West. DeLahunta wondered what kinds of relationships dance might develop with such practices. Since the financial collapse in 2008 and with the current and future effects of the 2020 health pandemic, it has become more challenging to find funding for research

into these kinds of questions about the intrinsic value of dance. It does not, deLahunta felt, make sense "…to *not* be making friends" with other forms of bodily practice.

Bodily practices imply "…a commitment of time and energy and labor" to accumulate "…skill and knowledge of the world through experience and sensation." DeLahunta noted, "The whole intellectual tradition around material cultures is different than around dance studies," so making conceptual bridges would be required. Colleagues across disciplines have been engaged in arguing for the same kind of recognition, and for developing a consistent, articulate, descriptive intellectual position "…that draws attention to things that are difficult to describe, which is experience." In this domain of the ineffable, the interviewee noted, language "…becomes a real challenge," and deLahunta believed it important to acknowledge when the process of using language takes over, and "… becomes something else."

This researcher said they spent a lot of time exploring the expression of "…what it is that somebody knows when they are dancing." The aim of this "…was to see to what extent that might replace verbal expression, so you could understand something better through seeing lines drawn on top of videos," for example, as was done in Forsythe's work. Other artists (such as Bill T. Jones) also began to pursue this "…same sort of logic that had something to do with making something invisible visible." But ultimately, deLahunta said, this catches you in a paradox.

> It does produce some form of expression, but it also has this odd way of potentially undermining your goal of collecting people around the idea that there is a value in bodily practices and bodily knowing that cannot be achieved through anything other way than practice or experience.

This dance researcher concluded that there is still interest from some people and some disciplines in the *application* of what movement-based practitioners know, but there is now little interest or investment in the "…investigatory dimension for practice… where practice is fostered and nourished." There had been some money for interdisciplinary research with people who were

keen and vested in contributing to the argument that bodily practices had value and should be given attention, but it is a real challenge today to find a young researcher, like "…a young cognitive neuroscientist, who has the scope of possibilities available to him or her to pursue…" This is in part because "…no one is going to do another neuroimaging study on mirror neurons when it has already been done."

This interviewee believed what might be most valuable for generating fruitful exchange across disciplines was a "sandbox" – time and space for collaborators to come together without pressure to produce, where those involved can explore and experiment freely. DeLahunta's vision forward is currently focused on bodily practice, technology, disability, and ethics.

Interdisciplinary Dance Studies #2

Another interviewee, Sydney Skybetter, had a choreographic background, and taught in a university setting. This dance researcher was engaged with "the data body." This particular perspective on the body shifts ideas about dance and choreography well beyond "…preoccupations with infrastructure and aesthetics," to consider the body and its movement in "…massively distributed" ways where the body is no longer limited to "…my corporeal fleshy stuff," but includes everything that the body

> …creates, animates, insinuates, gestures toward and away from, everything it might eventually do, and everything it has historically already done… If we take that transition seriously, how our expertise as embodied practitioners is understood, or can be wielded, changes dramatically. My bodily expertise can be wielded across any number of techno-cultural conversations, urgently and without apologies.

The question of ethics was uppermost here. For example, movement data enables robots to be programmed to move in extraordinarily agile and complex ways. While promotional material about these robots portrays them as amazing robotic dancing dogs, the potential use of these robots in war games and surveillance is evident. As technology races ahead into what

might seem inconceivable domains, the need for "…an ethical compass for how to make decisions" is paramount. Huge swaths of human body data, Skybetter commented, are gathered where only a small portion of it is needed or used, yet "…the ethical parameters around that can be postponed indefinitely," even though decisions that rely on much of this data can end up being about who lives and who dies.

By teaching non-dancers a felt sense of what it is to have and be a body, providing a sampling of what choreographies in the social domain might be, and "…introducing the problematics of embodiment now," Skybetter's students are confronted with questions about body ethics, so that they will have an experiential basis of understanding to inform their decision-making if and when they are hired by technology companies using body data.

Originally, this educator's intent was to try "…to get dance workers jobs at the Googles and Apples," but they found that "Getting a seat at the table ensures cooption." The "…apocalyptic unfolding" Skybetter perceived to be happening today "…requires counter-veiling myths." The question that arose in the conversation between this interdisciplinary dance studies educator and the researcher was that perhaps those stories "…are strictly embodied or affective… a function of the body as opposed [to] the cerebral and the rational…" Currently, this interviewee said, "…we have all of these systems that emerge to the detriment of embodiment and what does it mean to flip that?"

Skybetter has been engaged in generating a community of like-minded people with the hope of acting collectively to respond to the many challenges at hand. There is an immediacy and urgency that does not align with "…an academic time scale, or a production oriented time scale," to triage against what he described as "…a number of hegemonic forces that are all

coming into metastatic proportions right now….” In this context, one of the greatest challenges is figuring out what to do first, but “…we just don’t have time to ruminate.”

Skybetter identified some of the most critical things to be addressed, such as “…slowing things down so some of these ethical concerns can be addressed,” organizing against structures of the military-industrial complex, banning or abolishing facial recognition technologies, and banning or heavily legislating artificial intelligence. Because there are already organizations working toward those aims, he said, there is no need to create a separate movement, but rather, to support other people’s work. “Maybe the work IS supporting others,” Skybetter said.

Technology

One interview was conducted with the administrative manager of a university-based robotics center that explores how machines learn to recognize human movement. This involves extracting information from human gesture, providing numerous “pictures” to a machine, such as a phone, tablet, computer or robot, which then enables it to identify movement patterns and classify gestures. This procedure relies heavily on mathematical predictions of possibilities, and is both time-intensive and costly. The aim of this research is for computers to “understand” human gestures and, in this specific instance that understanding is used to help skilled workers engaged in manual activity in factories to avoid injuries.

Another project at this center for machine learning involved the preservation of crafts, such as glassblowing or pottery, which are predicted to disappear. The aim here is for computers to first learn and ultimately be able to teach people the motor skills needed for these crafts. Currently, prototypes are presented as museum installations where a “student” could, for example, imitate gestures seen in video recordings of a real potter while the machine analyzes and then uses specific sounds to correct the human’s gestures. The sounds are designed to be

aesthetically engaging and fun, actually, such as distortions in pitch when one is seated off axis, either too far forward or back, left or right.

Movement is being translated as gesture into data, and that data is being translated into information. This group is focused on using technology to protect workers from injuries and preserve craft-based skills, and demonstrates the possibility for technology to enhance human life. Nevertheless, the amount of money spent on these types of projects in contrast to direct investment in the preservation of the crafts themselves, for example, raises questions about investment priorities and future trajectories. The relationship between technology and the body seems to a great extent to result in the cessation of movement. This is a curious evolution that calls for reflection, discussion, and an explicit and conscious agreement about what is valued and wished for through the work we do, particularly in relation to such powerful technologies.

Neuroscience #1

There is an enormous amount of activity going on in neuroscience related to the body and its movement, including work related to human emotion, consciousness and behavior. After the discoveries of Antonio Damasio in 1996, the idea that these are all entangled with the body has become more accepted. Three experts in this field agreed to be interviewed.

The first of these three individuals, Jérôme Yelnik, was a retired director of research at a national health research center in a university hospital, and a neuroscience professor and researcher focused on Parkinson's disease and Obsessive-Compulsive Disorder (OCD). Parkinson's disease is a pathology where movement is disrupted. Parkinson's patients are not paralyzed; their muscles, motor cortex, and pre-motor cortex all work normally. The movement dysfunction is based on the death of the neurons that produce dopamine, the neurotransmitter related to reward and pleasure. There is, one could say, no sense of pleasure or reward in

moving. This might explain, in part, why dance and music have had some success in working with Parkinson's patients. In OCD, the circuits are the same, but the pathology is completely different, and rather than a dysfunction in the reward circuits, there is a hyper-functioning in automatic movement circuits.

Primate experiments in Italy during the 1990s revealed surprising findings associated with mirror neurons that demonstrated that our motor circuits respond when we see someone else do something, not just when we do it ourselves. While no longer a 'new' discovery, this idea has been developed as the neuronal basis of empathy. This was first demonstrated in the pre-motor cortex, which initiates and controls complex movements via the motor cortex, and then almost directly connects with the muscles. Later studies also showed mirror neurons were activated in the parietal cortex, giving us an image of our body in space, with a sense of how it works, and how it moves. Yelnik said that this is "…a general way of the functioning of our brain, to act in coordination and cooperation with other people."

As noted in the interview with the first somatics educator, newborns imitate movements from very early on, using positive or less welcome responses from those around them to learn which behaviors are successful in each specific context and relationship. This response is connected to the reward systems in the brain, and linked through internal circuits to motor activity. Both this reward system and mirror neurons clearly play an important role in how we move, individually and with others.

Neuroscience #2

Another neurologist who agreed to be interviewed, Sabine Meunier, also specialized in movement disorders, with a focus on the physiological aspects of both voluntary and involuntary movements. In this field, Meunier said, they have "… explored how brain and brainstem

compute and generate movements," and how body condition and environment participate in the construction, shaping, and update of movement and movement decisions.

Research in mind-body therapies such as yoga and meditation have demonstrated that morphological and functional changes arise in the brain through these practices. These physiological transformations refer to the brain's neuroplasticity, which includes changes in synaptic connectivity, the sprouting of nervous fibers, new synapse developments, etc. While it is not yet clear whether these changes endure over time, the new circuits and different networks can be used in other situations. This neuroscientist, who has practiced meditation and yoga for many years, thought it would be interesting to look at how refined attention to peripheral stimuli, as sometimes arises through yoga practice, might help to better integrate one's sense of body schema within the world. How yoga practice modifies social interaction was also suggested as an interesting direction that could be explored.

Thirty years ago, neuroscience understood movement as a simple chain of events, with a top down organization where you make a decision that goes to the motor and pre-motor cortex, then travels along the spinal chord to activate muscles. Over the past decades, Meunier commented, a large body of research has been developed focused on "…the building up of motor programs or learning processes" in this motor network. Recently, interest has developed in cognitive sensorimotor processing, which looks at areas "…upstream from the primary motor areas, or outside the cortex in the brainstem or the cerebellum." This puts the classical construct of "…a unidirectional causal relationship between intention and action" in question, and includes the study of intention and decision-making. The idea that "…action and its consequences might influence action selection," has recently been proposed, which suggests that our actions are

"…shaped over time by experience and sensory inputs, starting from the embryonic stage," and include social context, personal history, and beliefs.

There is currently a 17-member research team of international neuroscientists and philosophers led by Uri Maoz from Chapman University that is attempting to understand whether human actions are "…guided by conscious intentions, reached by rational deliberation," what we think of as free will, and whether or not this phenomenon "…can be backed by scientific evidence." A number of experiments have demonstrated that the moment of conscious awareness in decision-making, at least in certain experimental settings, arises after the chain of motor events has already begun. This, Meunier believed, was among the most important new directions in neuroscience today, with significant ramifications on our understanding of agency, coercion and responsibility.

Neuroscience #3

A third neuroscientist interviewed, Claire Wyart, was both a neuroscientist and a biophysicist who runs a research laboratory, Wyart Lab, at a major teaching hospital. When this group of researchers started their work ten years ago, their interest was in understanding the role of sensory feedback in locomotion. While much work had already been done with visual feedback, Wyart's interest was to look at aspects of feedback that were not consciously perceived because, while key to behavior, they remain for the most part unconscious.

Over the past century there has been an ongoing debate in neuroscience as to whether locomotion is internally driven and centrally processed, or externally driven by sensory information and our response to it. In the 1980s the central control hypothesis became predominant when researchers reproduced the same patterns of locomotion in a dissected preparation of the spinal cord by applying a cocktail of pharmacological drugs to "…increase

excitability of the nervous system." In this minimal preparation, fictive locomotion, which is locomotion without sensory or muscular participation, occurred without the need of any sensory feedback. Wyart argued that this was not the same as what really happens with intact, living animals, and that there was more to be investigated, particularly with new tools of modern biology that enable activation or silencing sensory feedback during active motion. Old physiological experiments with cats had shown that through sensory stimulation alone, it was possible to elicit reflexive movement patterns, and to activate the oscillatory pattern of spinal circuits that appears in all vertebrates when they move. However, there was more to discover.

Wyart introduced opsin into living zebrafish, in order to remotely activate sensory neurons with light. Opsin is "a light-gated channel engineered by biologists and used in neuroscience to manipulate the activity of neurons with light, a process called 'optogenetics.'" Wyart and her lab found they could trigger locomotion via light sensory stimulation alone. Thanks to the transparency and small size of zebrafish larvae, these animals can be studied live, *in vivo*, in close-to-natural environments and interactions. The laboratory found that silencing the sensory feedback that comes through proprioception, which is the "…inner sense enabling the internal detection of the contraction of skeletal muscles and tension in our tendons," consistently reduced both the speed and amplitude of movement.

The team also discovered a novel sensory feedback loop in the central spinal cord that detects curvature of the spine to readjust posture. The researchers observed that, similar to proprioceptive sensors on muscles, this novel sensory pathway in the spinal cord is also involved in the increased speed of locomotion. Most recently, the laboratory found "…that every time a zebrafish does a muscle contraction, you get a flow of the cerebral-spinal fluid." Wyart referred to the work of Steffi Dreha-Kulaczewski at the University Medical Center in Göttingen,

Germany, where she has been collecting data in humans that shows strong correlations between the flow of cerebral-spinal fluid and breath. Wyart explained that this effect does not come with random breathing, but requires the deep kind of breathing patterns she has seen and experienced in yoga.

Each muscular movement originates and triggers electrical activity in the nervous system, and large coordinated movements, like some yogic breath patterns, stimulate the flow of the cerebral-spinal fluid. In addition, sensory feedback loops stimulate not just faster movement patterns, but also more subtle, refined and precise expression in that activity. This supports Wyart's statement that the sensory system is very powerful, and justifies the call for further research.

Phenomenology

With a background in dance, history, philosophy, phenomenology and evolutionary biology the last interviewee, Maxine Sheets-Johnstone, holds a unique position in being able to advocate on behalf of our animate human nature in domains such as psychology, cognitive neuroscience, philosophy, and anthropology. "Movement," she said "…is our common heritage and mother tongue." Also an educator, Sheets-Johnstone is known for challenging definitions that lack precision, such as the dance mantra that "…movement is a force in time and space." This is not a truthful description, she explained, because "Movement creates its force, its space, and time" and has qualitative dynamics that are inherent to it. Disagreement with this institutionally approved definition of movement is just one example of the type of precision Sheets-Johnstone is known for, and the beginning of what she referred to as "…being more or less a heretic."

In Sheets-Johnstone's writing on animation and the human being, she has argued that the current focus on the brain and on enaction is "…deflective of an awareness of the foundational realities of movement, which are dynamic." In academic discourse, particularly in philosophy, the cognitive sciences, and psychology, talking about enaction is "another digression," like talking about behavior – which is not movement, and eludes movement.

> The dynamics of movement are really pivotal to meaning, and when people talk about action or enaction, they are… talking about a thing you are doing, but not really talking about movement. This bypasses the very foundation of our aliveness. We come into the world moving. We are precisely not stillborn.

When we avoid talking about movement, we evade awareness "…of the dynamics being created in any kind of movement." Those dynamics often have an affective "aura" or "propulsion." Sheets-Johnstone called for a respect of movement in its own right, and found the elision of movement very disturbing. The present-day emphasis in science on "the brain," with experiential descriptions of what it can ascertain, feel, etc. was also of deep concern. "The brain is part of a whole-body nervous system. The brain doesn't experience anything. It is we who are experiencing something, and movement is at its heart."

For those in the field of dance, Sheets-Johnstone hoped that there was more attention given to kinesthesia today than in previous years when the focus was often on imitating the teacher, or what the movement looked like. "Any realization of the meaning of movement comes from kinesthesia," which has "…a sensory faculty that has an evolutionary heritage." While feeling the movement is basic, it is commonly overlooked. The lack of attention to the feeling aspect of movement could, she said, "…dampen any meritable creativity." In very broad and general terms, Sheets-Johnstone had a strong commitment to, and understanding of how movement grounds us in experience, and in our creaturehood and aliveness.

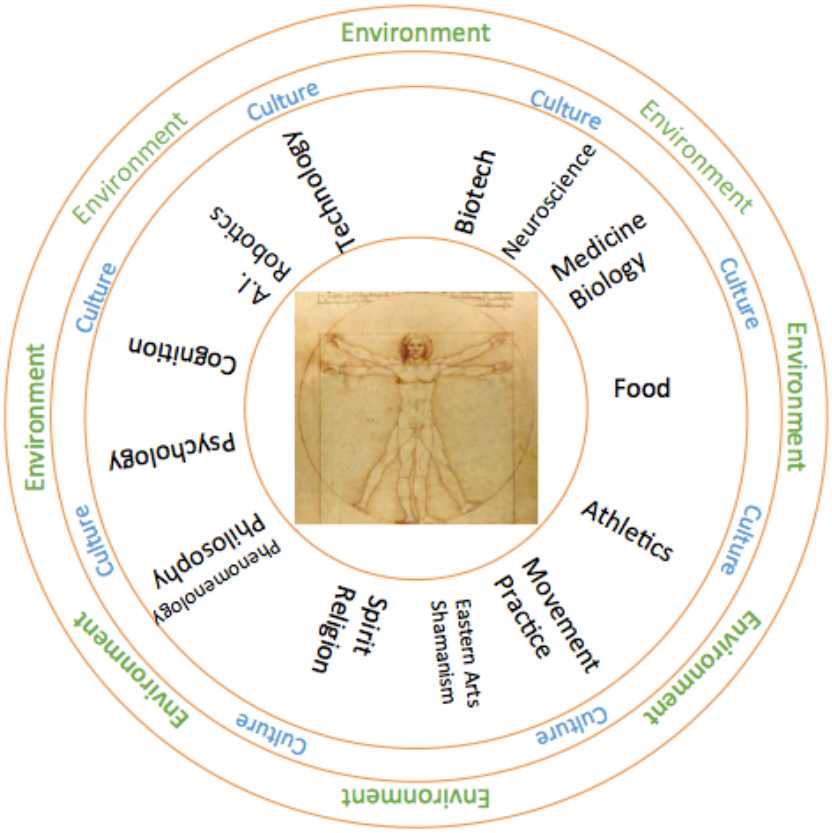
CHAPTER V

CONCLUSION

As previously mentioned, this thesis project aimed to explore the prevalence of, and interest in the human body and its movement across a variety of disciplines that do not normally rely on movement-based practice as a foundational basis for knowledge. Additionally, a preliminary attempt was made to understand the perspective of movement experts regarding some of the knowledge, skills, benefits and values they believed could be related to their practice-based work. This final chapter will briefly review the methodology used for this research, summarize the outcomes, and discuss both the implications and limitations of this study.

Methodology Review

This research project arose from a constellation of interdisciplinary literature focused on socio-cultural anthropology, and systems thinking, and relied specifically on publications from the fields of evolutionary biology, neuroscience, phenomenology, philosophy, psychology, somatics and technology. The researcher conducted two different surveys, one for those in disciplines other than movement-based practices, and one for movement practitioners. Interviews with experts across a range of fields were also conducted. As noted earlier in this document, these materials were analyzed with the aim of understanding the range of possibilities for future work related to the human body, and identifying areas of potential discourse, engagement, or collaboration across disciplines. Please see Figure 6 for a visual orientation of the disciplines touched upon for this study, with the body as the central hub of this research.



Central image Leonardo da Vinci's *Vitruvian Man*.

Figure 6: Orientation of disciplines related to this study.

Summary of the Outcomes

Interest and engagement in body studies was clearly present, and in many cases highly sophisticated amongst the interdisciplinary participants surveyed and interviewed for this thesis. Their methods for learning about the body and its movement were not restricted to intellectual means, but also included learning experientially, through their own bodies, and through movement-based practice. The challenges to interdisciplinary research involving body studies that were identified by these participants were significant, and deeply entrenched in both individuals and institutions. The primary challenge in working across disciplines was resistance to change, followed by a lack of communication, understanding and appreciation across disciplines, often identified as a need for a common language.

Movement experts surveyed and interviewed demonstrated deep grounding in the body and its movement, and an extensive and highly refined awareness of the subtle layers of information available through the body in motion, along with numerous personal, interpersonal, creative, and life skills or abilities. These included many of the 21st century skills, such as communication, creativity, critical thinking, resilience, perseverance, and self-discipline, but also included qualities that are important to being human, such as emotional intelligence, empathy and compassion, humor and playfulness, courage and curiosity, and an ability to sense the dynamics at play in relationships, and identify root issues or problems.

Interdisciplinary Surveys

The interdisciplinary surveys revealed that 66% of these participants found body studies of interest, and 37% considered the body a central focus in their field. This group of people came primarily from science and technology, education, health and wellbeing, cultural studies, art and design, and business. Rather than studying the body exclusively through books and lectures, 47% said they learn about the body directly through their own bodies and practice, and 67% said they learn about the body indirectly through the bodies of others. What motivated these individuals professionally was working with people, serving others or the larger world, creative problem solving, and learning. In their own work, they found dealing with people, getting funding or support, bureaucratic requirements, and resistance to change were significant challenges.

Over three-quarters (78%) indicated that they or their field engaged in interdisciplinary projects, and 90% of these indicated the lack of a common language, shared frameworks and logic was most challenging in their interdisciplinary work. The lack of opportunities for publication was also cited. These issues were directly related to the broader lack of understanding, appreciation, support, and funding. Individual personalities and egos were also problematic, along with a larger inability to see the importance or significance in collaborating.

Institutional resistance to change, siloed disciplines, and "useless degrees" in interdisciplinary studies were also cited among critical challenges. Nevertheless, of these respondents, 94% believed the contributions of their collaborators were valuable, and 88% believed their own work added value.

Survey participants reported that some of the a newfound interest in body studies could be attributed to a large aging population, advances in technology, new evidence in the relationships between mind and body, cultural shifts in the 20th century (including the contributions of feminist discourse, dance and performance studies), and more theory and research to build from. When working with the body, some of the challenges were conceptual, such as the idea that body and mind are separate and do not affect one another, and that movement does not relate to learning. Other challenges when working with the body included a lack of awareness or discomfort with the body, body image, issues of privacy, or taboos. A lack of empirical evidence in neurobiological changes related to the moving body was also cited, along with funding. The cultural, conceptual and linguistic gap between academics and practitioners was again referred to, along with the need for scientists and movement experts to talk more with one another.

Participants indicated important future work in interdisciplinary studies that included work with the mind-body relationship, mindfulness, consciousness studies, the generation of meaning, identity, agency, anxiety, trauma, affect, dementia, neuronal degeneration, neuroscience, optimal and accelerated learning, and eco-psychology. Physical health was also identified as an important field for continuing body-related research, with specific interest in aging, pain science, immunotherapy, infectious disease, and cell modification treatments, among others. While there have been numerous studies on meditation and brain function, there have

been far fewer focused on the body in motion. This was also identified as an interesting area for future research. In the domain of art and aesthetics, the human-technology interface was of interest, as well as using biometrics to identify brain and body responses when experiencing art. Social researchers identified the study of social-affective context and bodily processes, interpersonal communication, ethics, eco-criticism, and identities. Those involved in technology and its future work identified designing experiences, perception of movement, UX, haptics and, as in aesthetics, human-technology interfaces. Mobilities theory, the movement of people, things and ideas, was also identified as a new and important area of research related to body studies.

The small group of participants who indicated that the body was of very little importance to their work were concerned with communication and leadership training, the social psychology of the objectification of bodies based on gender and race, immunotherapy, and human impacts and behavioral change in relation to oceanographic research. Yet, any of these concerns would likely be perceived as very specifically related to the body from a movement expert's perspective. This outcome suggested that the relationship between the body, feeling, and behavior in humans has either not yet been sufficiently understood, or that understanding has not yet been sufficiently integrated into our educational and learning processes.

While there were some interdisciplinary participants who were admittedly largely unaware of their bodies, there were also quite a few who appeared to have a highly refined, and sophisticated awareness of their bodies. Most of these participants were most aware of their bodies while engaged in an activity, at a particular time of day, or when they experienced discomfort or pain. That said, 17% of these individuals indicated they were aware of their bodies throughout the day. Only a few respondents said they were aware of their bodies in relation to other people or the environment. It was noteworthy that no one indicated being most aware of

their bodies when in physical contact with other living beings, like animals, small children, or during sexual intercourse or lovemaking. Being aware of the body is a type of self-awareness, and perhaps when in contact with another living being one could be less aware of their own body, and more aware of the other being, or associated sensations. The reasons for this omission could not be determined in this research, but would be an interesting direction to pursue, particularly in coordination with the martial arts, contact improvisation, or mindful improvisation in groups, which all excel in the simultaneous awareness of self and other, or others.

Movement Expert Surveys

Movement expert survey participants rated themselves on a number of skills and capacities, which may or may not be related to their movement-based practice. As previously noted, these skills and abilities were grouped by enhanced awareness, personal and interpersonal skills, creative abilities, organizational skills, and physical or movement-related skills or capacities. Enhanced awareness had the highest ratings overall (all above 4.0 mean average, on a scale of 0-5), and participants said that these skills and abilities carried over into their daily lives. Under enhanced awareness, participants rated themselves highest for physical awareness, the awareness of gravity and bodies in space, awareness of dynamics in relationships, and spatial, sensorial, and internal awareness. They found their awareness of relational dynamics the most useful in their daily lives, although spatial, internal, sensorial and physical awareness were also greatly valued. Sound and touch were noteworthy additions, along with the awareness of the relationship between postural and physiological functioning, like breath and circulation. So, in addition to the physical and spatial knowledge and skill that would be expected from this group of movement experts, there was also strong self-awareness, sensitivity, and a solid sense of how people interact and move together.

The personal skills and capacities participants self-rated highest were the willingness to learn, reliability, integrity, grit and determination, curiosity, intuition, adaptability, and being comfortable in front of an audience. Of these, they valued intuition and adaptability, along with other capacities they had rated somewhat lower, including compassion, self-discipline, self-regulation, resilience, and having a positive attitude or outlook. In this category it was interesting that these participants self-rated high on being able to perform under pressure, manage their own strong emotions, feel at ease with change and remain mentally agile, but these qualities were not perceived as having great value in their daily lives.

The interpersonal skills and abilities in which these participants felt they were strongest were empathy, nonverbal communication, the ability to create or communicate meaning, the ability to motivate or inspire others, and being able to communicate comfortably with diverse types of people. What they most valued in their daily living was their skill in nonverbal communication, deep listening, communicating comfortably with different types of people, being able to motivate or inspire others, and being able to create or communicate meaning. Many participants expressed their desire to improve in a number of these areas, which seemed to indicate both an interest in interpersonal skills, and humility in recognizing their own limitations.

On the creative front, the skills and abilities movement expert participants self-rated highest, were also the skills or abilities they valued most in daily living. These were the ability to communicate or express through the body, creativity or ingenuity, imagination, improvisational facility, and thinking ‘outside the box.’ Participants also strongly valued their ability to give and receive constructive feedback. In self-rating on organizational skills, this group of participants thought they were strongest at meeting deadlines, identifying root issues, solving problems

creatively, and being goal-oriented. In their lives, they most valued time management, their goal orientation, and being able to prioritize, multi-task, and meet deadlines.

In the physical domain, these participants felt they excelled in their physical intelligence, movement literacy, psycho-emotional health and wellbeing, movement efficiency, physical articulation, and coordination. What they valued most was psycho-emotional health and wellbeing, overall physical health, physical intelligence, movement literacy, and coordination. It was important to note that 75% of movement expert participants were over the age of 45, with one-quarter of these (16) between 68 and 84 years old.

Participants' awareness during their movement practice was also queried. Approximately three-quarters of this group (over 75%), reported being aware of both body and spatial relations, energy, flow, sound, and others directly involved in the movement practice. An even larger number (88%) were aware of their own emotions while engaged in practice, and 73% were aware of the emotions of others. A strong majority (78%) was aware of imagery related to the task at hand while practicing, and over half (55%) were aware of imagery not obviously or directly related to their movement task. An overwhelming majority of participants (94%) noted being aware of insights, intuitions, or revelations while engaged in their practice. These included personal, creative, and relational insights, and extended, in some instances, to insights into the nature of reality, or to the sense of accessing wisdom beyond "…the sphere of me or mine."

Comparative Perceptions of Body-Mind

Comparing movement expert and interdisciplinary participants' personal sense of where they felt their mind resides revealed that 24% of movement experts believed the mind resided throughout the entire body, and 11% believed the mind was not limited to the body but existed everywhere. In comparison, only 12% of interdisciplinary participants felt the mind resided in

the entire body, although 7% believed it existed everywhere. The belief that the mind resided in the region of the head alone was held by 21% of interdisciplinary participants, in contrast to 15% of movement experts. Further, a small group of movement experts (10%) believed the mind resided in the chest or heart region alone, while only 3% of the interdisciplinary participants held this view. Please refer to Table 14 on page 62, for some of these details.

One movement expert commented: "The 'mind' is our awareness of self." As mentioned earlier in this document, another movement expert participant found the mind to be anywhere in the body they chose to focus, while yet another noticed a shift in sensed location with age and decreased movement. These examples of embodied conceptions of mind suggest the possibility that the mind might be not only relational, but also dynamic, with a capacity to shift location depending upon the focus, movement or use. Again, although beyond the aims of this research project, these findings might be interesting to consider and explore in more depth.

Movement experts believed their work contributed to the world through its ability to instill a sense of wholeness, integrate mind and body, enhance creativity, augment innovation, and develop important life skills, like physical and emotional health, agency, resilience, empathy, self-regulation, and self-knowledge. Balancing thinking, sensing and feeling was also noted. Further, movement expert participants believed their work contributed to the world by helping people to remember our common humanity, recognize our interdependence, and develop and maintain a sense of community. Their work, they believed, reminds people through their bodies what it means to be human. These participants most admired their peers' dedication, creativity, authenticity, mastery, perfection, and humanness. Strong admiration of their colleagues' ways of thinking was also expressed, and described as rigorous, deep, creative and curious. Other qualities appreciated and admired among their peers were humor, passion,

courage, playfulness, and simplicity. The sense of isolation, and deep need for community was also noted.

When asked what they most wished others understood or appreciated about their work, movement expert participants said they wished others recognized that the sensory-kinetic system is the foundation for our interactions and understanding; that there are multiple ways of knowing, all stored within the body; and that we both have and are a body. One respondent wished that dance could disrupt the tendency to privilege linguistics in academia, another wished "…the power and value of our knowledge" was appreciated, and yet another wished others understood the value of the creative possibilities existent within, and as a group.

Interviews

Among the eleven interviews conducted, two perspectives came from movement experts in dance education. One aimed to teach in a way that students could "…experience and understand the inherent logic of the body itself." This educator saw the body as the core for humans, at all stages of development, and saw dance as a symbolic language of the body connected to intellect, imagery, and an expression of who we are and what we live. Their approach used dance to convey an understanding of complexity, making connections and relationships explicit. This person also warned that focusing on one element in isolation tended to result in distortions that were injurious rather than useful.

The second dance educator interviewed commented on dancers' familiarity with the ephemerality of both dance and life, stating that those who continued to dance throughout their lives experienced a series of "mini-deaths" as they shed identities over time, and with age. This person particularly appreciated the internal awareness available through the body. This awareness, they said, had the ability to bring unconscious layers of experience into awareness,

and to help people make sense of their lived experience. This individual expressed deep concern that the lack of real connection with the body was at the root of a global mental illness that has been developing throughout the world.

Two somatics practitioners shared their perspectives on the body as well. One identified the importance of the body's deep intelligences, such as the element of awareness present in the cells, tissue and organs. This person said the purpose of the gut brain is to assess whether or not one is safe, while the heart brain is used to engage relationally. When these two 'brains' are working smoothly, the role of the head brain is to "…respond creatively to new stimuli in the environment." When fully integrated with one's body, this somatics expert said, awareness of the effects of one's actions on other people, on other beings, and on the planet is unavoidable. But language does not suffice. Experience is necessary. "Once you've been there… there is a knowing from an embodied perspective."

The second somatic practitioner raised the question, "What do we mean by embodiment?" and believed it important to recognize that our maps or ideas of embodiment are our perspectives of what is, rather than what actually is. Concepts and ideas about embodiment are influenced by one's own subjective, and embedded patterns and values. This somatics educator advocated for taking on the exercise of "…the subjectivity of language," by clarifying our language and asking what others mean, "…rather than assuming we know," and in this way, stretching our understanding and our ideas.

Two perspectives from interdisciplinary dance researchers were also offered. The first had vested twenty-five years exploring "…the claims for what dancers know through skillful bodily practice." Funding for this type of research was an important reality, and while there is still an interest and resources for the *application* of what we know, there has been a decline of

funding since 2008 for research pertaining to the intrinsic value of bodily practice. Cultures outside of the western tradition that value ways of knowing based on bodily practice or craft might offer interesting avenues for deeper understanding. This would require making conceptual bridges, and developing a consistent intellectual position that draws attention to experience, and to the ineffable.

The second interdisciplinary dance researcher was focused on the movements and 'choreographies' of the "data body," which expands in "…massively distributed ways" that are not limited to the physical body, but also to all that it is connected to. This includes what it creates, animates, gestures toward or away from, what it has already done, and even what it might potentially do. The expertise of embodied practitioners, informed by their rich experience in organizing and making sense of bodies in motion, becomes relevant across "…any number of techno-cultural conversations…." The knowledge of movement experts is called for, and highly relevant to these conversations. Technological advances have created an urgent need for "…an ethical compass about how to make decisions." Teaching non-dancers what it is to have and be a body, and introducing them to some of the issues raised concerning embodiment serves as an introduction to these ethical challenges. Supporting others engaged on the front lines of social change, and slowing things down so that some of these ethical concerns could be addressed were identified as key areas for immediate action.

One interviewee working in the field of robotics explained the process of translating human movement into a computerized "understanding" of human gesture. This type of machine learning is being put to use to help factory workers avoid injuries, and to preserve craft-based skills such as pottery and glassblowing. This is a time consuming and costly process that raises the question of how technology can and should enhance human lives and experience. Does the

technology ultimately, and perhaps unintentionally, lead to the cessation of human movement and human knowledge? And, how are these technological supports likely to affect human development in the long run?

Activity in neuroscience related to the body and its movement touches upon aspects of human emotion, consciousness, and behavior. Three neuroscientists agreed to be interviewed for this research. The first provided information about mirror neurons, their relationship to the motor cortex, premotor cortex, and parietal cortex, and their role in empathy, human cooperation, and human coordination. The importance of the reward system in human movement and behavior was also identified.

The second neuroscientist interviewed highlighted a study that revealed positive morphological and functional changes arising in the brain through the practice of yoga and meditation. This was an important finding, although it was not yet clear whether these changes endure over time or not. This neuroscientist identified additional areas for mind-body exploration which included studying the relationship between yoga practice and the schematic perception of one's body in relation to the world, and how yoga practice might modify social interaction.

Further, researchers are studying the relationship between action, its consequences, and future action selection. It is possible that neuroscience will agree that human actions are "…shaped over time by experience and sensory inputs, starting from the embryonic stage," including influences of social context, personal history, and beliefs. This second neuroscientist believed the most important new direction in their field was exploring understandings of agency, coercion, and responsibility.

The third neuroscience researcher was also a biophysicist who directed a laboratory that was exploring locomotion and behavior in zebrafish. This neuroscientist noted that the role of

sensory feedback in locomotion was of interest because, unlike visual feedback, it is often unconscious. This researcher explained that using a new biotechnology called optogenetics to manipulate neuronal activity through light sensory stimulation has revealed the critical role of sensory feedback for locomotion, along with a sensory feedback loop in the central spinal cord that adjusts for spinal alignment. This suggests that there resides a self-regulating intelligence within the body that is not limited to the brain. Each muscular movement initiates electrical activity in the nervous system, and large coordinated movements, including specific types of breathing patterns, stimulate the flow of cerebral-spinal fluid. This implies a powerful relationship between the nervous system and movement, although the full significance of these findings is yet to be determined. What was clear from this researcher's work was that sensory feedback loops are related to not only accelerated locomotion, but also more refined and precise expressions in that activity.

The last interview was with a phenomenologist who was a dancer and choreographer, with solid grounding in evolutionary biology. This person described movement as "…our common heritage and mother tongue," and warned against evading its importance in animate life, and in human life. This phenomenologist criticized the tendency in philosophy, cognitive science and psychology to talk about behavior, action, and enaction because they ignore the dynamics and kinesthesia, or "…feeling aspect of movement" that often has an affective quality to it. Kinesthetic awareness is founded in "…a sensory faculty that has an evolutionary heritage," is foundational to one's sense of feeling alive, and is pivotal to meaning.

Limitations

The study had a number of limitations, including the subjectivity of the self-rating exercise in the movement expert survey, potentially unclear directions on survey questions

related to image selections, as well as the limited number of responses to the interdisciplinary survey, particularly in relation to the large number of different disciplines represented.

However, foremost among the limitations to this study were the certain bias of the researcher, and the possible bias of the majority of interdisciplinary respondents, in spite of the large variety of disciplines and fields they came from. The interdisciplinary survey required a minimum of twenty minutes to complete, and included many open-ended questions, which required a significant amount of thought and reflection on the part of respondents. While not always the case, it was nevertheless likely that many of those who engaged in and completed this survey, did so because they were already curious about the body and/or its movement, and how this might relate to their work. This openness, while greatly appreciated and absolutely necessary for the successful implementation of this research, also, curiously, revealed a possible limitation in this, and perhaps many similar studies. Another limitation of the study was that the research instruments were created by the researcher and were not externally validated or checked for reliability.

Additionally, for this research an expert level in movement practice was equated with ten years or more of regular and dedicated practice. The researcher did not inquire into the difference in the depth of knowledge between a practitioner with ten years of experience, and one with a lifetime of experience. Based on the researcher's experiential knowledge, this difference is likely to be significant and would be interesting to explore. It would also be interesting to compare depth of knowledge between those with just a few years of experience and those with ten years of experience.

Discussion

Our values and interests are reflected in what we do and how we do it. This affects our development, how we live together, and the world that we live in, which in turn, affects what we know, believe, care about, and do. This is the interplay Maturana referred to as the co-evolution of organism and niche. These cycles of behavior over time are thoroughly entwined with our bodies, and determine our culture, our manner of living, and how we evolve.

The body is comprised of mechanical and electrical circuitries that beautifully express the physics of the material universe, yet every action, interaction, thought and feeling we have is also connected to bio-chemical processes, which are laden with affect, feeling and emotion. Every action, interaction, thought and feeling we express affects others, our world, and ourselves in ongoing and recursive cycles. The feedback we receive from others and from the world around us through our bodies, like the rudder on a boat, serves to guide and moderate our behavior to align with the ever-changing situation, and our ever-changing selves. The advice to feel our discomfort is not a platitude, but a crucial step in reengaging with the body's natural feedback system, which is critical to our ability to navigate our world well.

As we reconnect with the very same bodies we have learned to silence and ignore, we become conscious of not only our internal physical states, but also our internal world of thought, feeling, sensation, and emotion. We also, naturally, become more aware of our relationships with others and with our world, because they affect us. Our awareness of the effects of our actions on other people, on other beings, and on the planet becomes unavoidable. The research gathered here suggested that this feedback could be critical to the human ability to empathize, coordinate and cooperate with others. Language does *not* suffice. Experience not only informs, but actually forms us. It is as if the development of consciousness is dependent upon the feedback available

through the body, like a crucible that tempers us with compassion for others. If the mind that created the problems we are confronted with is *not* the same mind that can solve these problems, as Einstein and Bateson believed (Moradian 2), then clearly technoflight, a term proposed here that describes the use of technology to escape the body, is not the answer. Rather, this high-tech evasion becomes a technological version of spiritual bypassing, which uses spirituality to avoid the full-bodied wholeness of human experience. But with this evasion, it is possible that the development of our consciousness is stunted.

The movement experts who participated in this research reflected a strong influence from not only dance, but also from somatics, improvisation, and eastern movement-based arts, such as yoga and the martial arts. These specific approaches to embodied learning share a particular interest in the study of the connections between mind and body, and also between self and other. It is possible that other movement-based pursuits such as competitive gymnastics or rugby would correlate with very different skills, capacities and abilities. This could be an interesting direction for further exploration.

The list of skills and abilities these movement experts identified as their strengths was actually, quite remarkable. In addition to a well-integrated engagement with the imagination, intuition, and creativity, these individuals were adaptable, relatively at ease and creative in face of the unknown, with the ability to improvise, remain positive and goal-oriented. Not only that, these individuals were willing to learn, comfortable in thinking 'outside the box,' with an ability to decipher, create and communicate meaning. These highly creative and adaptable individuals were endowed with a solid dose of willpower and perseverance, and beyond this, with excellent communication and interpersonal skills. They had a high level of awareness of their own and others' emotions, the ability to manage their strong emotions, and stay focused and functional

under stress. Their ability to express themselves and read others well, to communicate comfortably with diverse types of people, and to sense the dynamics in relationships indicate highly developed and refined communication skills.

The movement experts responses and comments suggested that they do not simply have knowledge about bodies in space, or sensorial and interoceptive information, but powerful human skills and creative abilities that are required for not just communication and understanding one another, but a kind of knowledge and know-how about how to co-exist. In addition to all of these qualities, this group of movement experts indicated that they had the ability to discern root issues, and predict possibilities, which could potentially enhance these interpersonal skills to an unusual and remarkable level. It would be interesting to research these two latter abilities further, along with their relationship to the larger constellation of qualities and skills shared by these movement experts.

The fact that participants identified the recognition of our shared humanity as an important contribution they and their work offer to the larger world should not be discounted. Again, for movement experts this is not a platitude or trite observation, this is a reality in their daily living based on their experience and knowledge. The links of these movement experts through their practice to ancient wisdom traditions is not a coincidence. This deep knowledge and wisdom within the body cannot be accessed through the intellect alone. It requires slowing down, and observing so one can sense, feel, and ponder. When the mind and body are reintegrated as they are through the practice of mindful movement, thinking, feeling, and doing are also integrated to produce a unified wholeness, not in isolation, but with and in our world. The knowledge these movement experts seemed to have and to share is a kind of know-how or

skill for living well together, and in living well together, establishing and conserving psycho-emotional health and wellbeing over a lifetime.

Embedded deeply within the question of how people might live well together lies the key question of whether humankind, at the core, is good or evil (Curtis). But if we accept Maturana and Sapolsky's assessment that violence against one another is not inevitable but is learned and perpetuated through our manner of living together, then the fact that learned fear can be unlearned is vital. In states of fear one does not think well, or behave at their best. Sapolsky's question of how systems of cooperation ever get started is an important one here, and his advice to treat one another well becomes more than a mere nicety, but a critical necessity.

Tens of thousands of years of evolution helped 'wire' people in such a way that living together in social cooperation, with respect and trust, matters. When individuals are deprived of healthy social relations, what Maturana calls loving relations, they become sick (Maturana). In his book on addiction in the United States, Johann Hari said "…we've created a society where a significant number of our fellow citizens…can't bear to be present in their lives" (Hari; Eddy and Moradian 5). This raises the question, should relationships based on manipulation, competition, and domination be conserved and perpetuated simply because they are familiar and therefore comfortable?

The discomfort one feels when experiencing fully, with, in, and through the body, both alone and in relationship with others, is very much like the eye of the needle one must pass through to access the full-bodied being of the human experience. Because this experience of being fully and consciously animate embraces not just the vitality but also the vulnerability of being alive, it can awaken empathy and compassion. Paying mindful attention to the body and the feedback available through it brings the links between feeling, behavior, and consciousness

to life. This creates integrity and coherence on the individual level, improved communication and interaction on a relational level, and a felt sense of the surrounding world. It becomes viscerally, sensorially, and emotionally apparent that individual behavior is intertwined and co-evolving with the larger human world, with the living world, and with the environment.

Within the body is the knowledge and wisdom needed to live well together. Every body has this knowledge. Any mindful practice initiates this journey toward self-awareness and toward wholeness. Whether walking, gardening, breathing or dancing, movement-based practices offer the opportunity to practice again and again how to respond to new situations, new information, discomfort, and others. Some practices focus on control and manipulation, or perpetuate the mind-body disconnect with mind-over-matter approaches, or replicating patterns and forms. But there are many movement-based practices, both old and new, that approach the body as a source of intelligence and deep knowing. Amongst these, some practices focus more on becoming aware of interoceptive or internal information, whereas other types of practice might focus on relationship and the encounter with others, or improvisation and responding to the unknown. The longer a person practices, and the more deeply he or she pays attention while moving mindfully, the richer and more subtle the knowledge, and more deeply-rooted the know-how likely becomes. Because people are not simply informed, but also in-formed by the habits and patterns practiced, what is practiced matters. Further research in this domain is called for.

This reconnection to full-bodied being in motion, in dynamic relationship with others and with our environment offers a very simple systemic solution to the problems of our times. It is not sufficient in and of itself, and does not discount in any way the need for all of the other skills, abilities, knowledge and tools humankind has acquired over the centuries. Yet, in spite of its simplicity, the proposition of reclaiming the wisdom of *being* a living animate body, and adding

this knowledge into every scenario, question, exchange, action and interaction has the possibility of shifting the paradigm of human experience dramatically. Being a body is simple, but not necessarily easy. The discomfort of feeling is far from negligible, and resistance is interwoven with a deep fear of death, change, chaos, and the unknown (Moradian 4). With centuries of suppressing awareness of felt bodily experience, establishing new patterns, habits and understandings will require a concerted effort – will require practice.

The relationship between the body, feeling, and behavior in humans has not yet been sufficiently understood or, as stated earlier, that understanding has not yet been sufficiently integrated into our educational and learning processes. Integrating embodied knowledge and experience into all learning environments, at all levels of education, would be interesting and potentially groundbreaking. *Dance for Every Child* in New York City, the vision of Jody Gottfried Arnhold, while limited to the genre of dance, begins to establish a prototype of how this might work.

As the mind-body split continues to be repaired, the ethics of embodiment will become more and more glaringly important. Simultaneously, paying attention to and taking responsibility for the impacts and implications new technologies have on human beings, their movement, the body, and human evolution is urgently called for. Innovations in technology and the impacts of climate change will both continue to shift understandings of bodies in motion in powerful new ways. The perspectives of movement experts are likely to be of potential and particular value.

The body has been missing in action for centuries, but is now moving toward center stage. Resistance to change might be one of the first places to look at, both personally, and within our institutions. Clearly, given the impacts of climate change, the speed of technological developments, along with humankind's current manner of living together, becoming expert at

meeting the unknown creatively, constructively, and humanely is a needed and necessary skill. Learning and life itself are founded on movement and transformation, yet humans have managed to persuade themselves that they can arrest life's motion. Perhaps rather than arresting life's motion, it is time to embrace it.

Conclusion

As neuroscience, psychology and behavioral studies begin to understand how deeply interlaced their research is in and with the living body, turning toward movement practitioners for insights and guidance may prove fruitful. This will require becoming more familiar and comfortable with one another's language, frameworks and methods. It also suggests that those involved in body-related research would benefit from movement-based practice, and that movement practitioners would do well to become adept at using language to communicate what their work can do. Learning how to structure accessible experiences for non-movers would also be of great value.

There *is* interest in the body, and interest in all the layers of its movement, not only physical, but also emotional, cognitive, inter-relational, and creative. The mind-body connection continues to be of great interest. Psychology, the social sciences, education, health, aging, neuroscience, technology and creativity are among those disciplines engaged in and curious about body studies. But whether that interest aims to exploit this knowledge without consideration of the implications on our world, or whether the aim is to integrate that knowledge constructively and responsibly for the benefit of humanity is of concern. In the same way that scientists are beginning to assume responsibility for their knowledge and discoveries, or at least to begin to discuss this, movement experts would be well advised to assume responsibility for their knowledge and skills, which are powerful and can be wielded for social and planetary good,

or ill. The aims and motivations driving our education, and our search for knowledge, matter. Gathering in local focus groups and through professional communities such as the National Dance Education Organization (NDEO), the Dance Studies Association (DSA) or the International Somatic Movement Education and Therapy Association (ISMETA) offers important opportunities for this type of discussion and sharing.

People outside of movement-based practice have begun to approach body studies with intelligence and sophistication, and appear to be recognizing the importance and potential impacts of experiential learning in this domain. However, communication across disciplines remains challenging, particularly because movement-based practice relies, and must rely on the 'language' of experience to instill much of its essential knowledge or understandings. Establishing a common language is likely to impose serious limitations on interdisciplinary discourse, such as imposing a single right way to understand or relate to the body. Nevertheless, creating a lexicon for shared use across the broad topic of body studies might be a worthwhile endeavor. Identifying and gathering research and knowledge concerning the body into a shared and easily accessible resource would also be useful for researchers in this large interdisciplinary field.

Understanding how patterns of movement – feeling, thinking, and doing – shape humanity through culture, and how consciousness and decision-making shape our world are of vital importance. Putting the body's innate intelligence and wisdom to work is critical for transforming human patterns of manipulation and domination into patterns of responsive cooperation and mutual respect. The choice is real and present in every moment. Will humankind continue to act out the story of life put forth by Ward in his Medea hypothesis, where life is witlessly destructive? Or can humans reconnect to their bodies' inbuilt feedback systems and use

this knowledge to become more conscious of their motivations, make choices about them, and learn to navigate the world well. Through the practice of being a body, can humankind come to know and understand themselves, self-regulate, connect with one another and the world, and adapt creatively so that all life can thrive on this beautiful planet? As Maturana made very clear, each person chooses what we are becoming through their actions and interactions with one another and with the world. What we conserve will determine the evolutionary fate of the human species.

WORKS CITED

Arendt, Hannah. *The Human Condition.* University of Chicago Press, 1958.

Baring, Anne and Jules Cashford. *The Myth of the Goddess: Evolution of an Image.* Arkana - Penguin Books, 1993.

Batson, Glenna and Margaret Wilson. *Body and Mind in Motion: Dance and Neuroscience in Conversation.* Intellect, 2014.

Brown, Brené. *The Power of Vulnerability*. TedX Houston, 2010. Video retrieved 10 November 2019 from: https://www.ted.com/talks/brene_brown_on_vulnerability.

Byrge, Lisa, Olaf Sporns and Linda B. Smith. "Developmental Process Emerges From Extended Brain-Body-Behavior Networks." *Trends in Cognitive Science,* vol. 18, no. 8, August 2014, pp. 395-403.

Capra, Fritjof. *The Web of Life: A New Scientific Understanding of Living Systems.* Anchor Books, 1996.

Capra, Fritjof and Pier Luigi Luisi. *The Systems View of Life: A Unifying Vision*. Cambridge UP, 2014.

Chatain, Drew. "Leaving Well Enough Alone: A Review of Michael Hauskeller's *Better Humans? Sex and the Posthuman Condition,* and *Mythologies of Transhumanism*." *Ethical Perspectives*, vol. 25, no. 4, 2018, pp. 795-806.

Cherry, Kendra. "A Historical Timeline of Modern Psychology." Published 11 October 2019. Retrieved 1 December 2019 from https://www.verywellmind.com/timeline-of-modern-psychology-2795599.

CNBC. “Why Elon Musk, FaceBook and MIT are Betting on Mind-Reading Technology.” Published 11 May 2019. Retrieved 17 October 2020 from https://www.youtube.com/watch?v=R3G5fzz76lQ.

Craig, Bud. “A Complex Mapping of the Interior Sense: Why Damasio’s Theory Focuses on the Brain Stem and Viscera.” *Neurophenomenology*, 2013. Retrieved 9 November 2019 from https://neurophenomenology.wordpress.com/2013/06/11/a-complex-mapping-of-the-interior-sense-why-damasios-theory-of-embodied-cognition-focuses-on-the-brainstem-and-viscera/.

Curtis, Adam. *Century of the Self,* a four-part BBC documentary. Published 2002. Retrieved April 2018 from https://www.youtube.com/playlist?list=PLktPdpPFKHfoXRfTPOwyR8SG8EHLWOSj6.

Damasio, Antonio R. “The Somatic Marker Hypothesis and the Possible Functions of the Pre-frontal Cortex.” *Transactions of the Royal Society* (London), vol. 351, 1996, pp. 1413-1420.

---. *The Feeling of What Happens: Body and Emotion in the Making of Consciousness.* Harcourt and Brace, 1999.

Diamond M.C., et al. "The Effects of an Enriched Environment on the Histology of the Rat Cerebral Cortex." *Journal of Comparative Neurology*. vol. 123, no. 1, 1964, pp. 11-120. doi:10.1002/cne.901230110. PMID 14199261.

Dove, Guy. “How to Go Beyond the Body: An Introduction” in *Frontiers in Psychology,* vol. 6, no. 660, 2015. Published online 21 May 2015. Doi: 10.3389/fpsyg.2015.00660. Retrieved 30 August 2020 from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4440352/#__sec1title

Drake, Amy. “Lilith’s Evolution: How Did Adam’s First Wife Metamorphize From a Demon Spirit Into an Icon of Women’s Liberation,” paper presented at South-Central Renaissance Conference, University of North Georgia, April 2018.

Eddy, Martha. *Mindful Movement: The Evolution of the Somatic Arts and Conscious Action.* Intellect, 2016.

Eddy, Martha Hart and Ann Lenore Moradian. “Childhoodnature in Motion: The Ground for Learning.” *Research Handbook on Childhoodnature*, edited by Amy Cutter-Mackenzie, et al., Springer International Publishing AG, 2018, pp. 1-24. doi: 10.1007/978-3-319-51949-4.

Feldman, John. *Symbiotic Earth: How Lynn Margulis Rocked the Boat and Started a Scientific Revolution*. Hummingbird Films. 2018.

Glenberg, Arthur M. “Embodiment as a Unifying Perspectives for Psychology.” *WIRES Cognitive Science Advanced Review*, vol. 1, July/August 2010, pp. 586-596.

Glenburg, Arthur M., Jessica K. Witt, and Janet Metcalfe. “From the Revolution to Embodiment: 25 Years of Cognitive Psychology.” *Perspectives on Psychological Science,* vol. 8, no. 5, 2013, pp. 573-585. doi: 10.1177/1745691613498098.

Harari, Yuval Noah. *Sapiens: A Brief History of Humankind.* Vintage, 2011.

Hari, Johann. Video interview “Chasing the Scream: The First and Last Days of the War on Drugs” on *Reality Asserts Itself.* Published 6 March 2015. Retrieved 10 November 2020 from https://therealnews.com/johannharirai0204pt2.

Jorgensen, Ellen. *Biohacking: You Can Do It Too*. TEDGlobal 2012. Retrieved 11 December 2019 from

https://www.ted.com/talks/ellen_jorgensen_biohacking_you_can_do_it_too/transcript#t-94117.

Lee, Bruce Y. "In Case You Are Wondering, Sex With Robots May Not Be Healthy," *Forbes Magazine*, published 5 June 2018. Retrieved 6 September 2020 from https://www.forbes.com/sites/brucelee/2018/06/05/in-case-you-are-wondering-sex-with-robots-may-not-be-healthy/.

Lent, Jeremy. *The Patterning Instinct: A Cultural History of Humanity's Search for Meaning.* Blackstone Audio, 2017.

Lovelock, J.E. *Gaia: A New Look at Life on Earth.* Oxford University Press, 1979.

Maturana, Humberto. Online open discussion with Matriztica community. Matriztica, 2020.

Maturana, Humberto and Gerda Verden-Zöller. *The Origin of Humanness in the Biology of Love*. Imprint Academic, 2008.

Maturana, Humberto and Francesco Varela. *The Tree of Knowledge: The Biological Roots of Human Understanding.* Shambala, 1998.

Mindfulness Based Stress Reduction. Wikipedia. Retrieved 10 November 2019 from https://en.wikipedia.org/wiki/Mindfulness-based_stress_reduction

Moradian, Ann Lenore. "Improvisation – Dancing With Complexity," unpublished paper, 2018.

Moyers, Bill. *Healing and the Mind.* Doubleday, 1993.

National Geographic. "Mass Extinctions" (reference). Retrieved 1April 2018 from: https://www.nationalgeographic.com/science/ prehistoric-world/mass-extinction/

Sapolsky, Robert M. *Behave: The Biology of Humans at Our Best and Worst.* Penguin Books, 2017.

Sheets-Johnstone, Maxine. "If the Body is Part of Our Discourse, Why Not Let it Speak? Five Critical Perspectives." *Surprise: An Emotion?*, vol. 97, edited by N. Depras and A.J. Steinbock, Springer, 2018, pp. 83-95. doi: 10.1007/978-3-319-98657-9_5.

Simpson, David. *Our Posthuman Future.* TEDx Talks, Santo Domingo. 10 February 2016. Retrieved 11 December 2019 from https://www.youtube.com/watch?v=uAb-mSq615g.

Sosa, Jason. *The Coming Transhuman Era.* TEDx Talks (Grand Rapids). 14 June 2014. Retrieved 11 December 2019 from https://www.youtube.com/watch?v=1Ugo2KEV2XQ.

Stromsted, Tina. *Soul's Body: Healing the Body/Psyche/Soul Split through Conscious Embodiment.* 27 February 2017. Webinar retrieved February 27, 2017 from https://www.authenticmovement-bodysoul.com/souls-body/.

Tantia, Jennifer Frank. "Toward a Somatically-Informed Paradigm in Embodied Research." *International Body Psychotherapy Journal, The Art and Science of Somatic Praxis,* vol. 18, no. 2, 2019, pp. 134-145.

Taylor, Eugene. "William James on a Phenomenological Psychology of Immediate Experience: The True Foundation for a Science of Consciousness?" *History of the Human Sciences,* vol. 23, no. 3, 2010, pp. 119-130. Doi: 10.1177/095269511036344.

Van der Kolk, Bessel. *The Body Keeps the Score.* Penguin Books, 2014.

Ward, Peter. *The Medea Hypothesis: Is Life on Earth Ultimately Self-Destructive?* Princeton University Press, 2009.

Wikipedia. Behaviorism. Retrieved 1 December 2019 from https://en.wikipedia.org/wiki/Behaviorism.

Wikipedia. Posthumanism. Retrieved 12 December 2019 from https://en.wikipedia.org/wiki/Posthumanism.

Wikipedia. Timeline of Psychology. Retrieved 6 September 2020 from https://en.wikipedia.org/wiki/Timeline_of_psychology.

APPENDIX A

INSTITUTIONAL REVUE BOARD APPROVAL LETTER AND DOCUMENTATION, CONSENT FORMS, AND PROJECT DESCRIPTION

UNIVERSITY OF
NORTHERN COLORADO

Institutional Review Board

DATE:	December 20, 2019
TO:	Ann Lenore Moradian
FROM:	University of Northern Colorado (UNCO) IRB
PROJECT TITLE:	[1510195-2] Missing in Action: Locating the Body in Interdisciplinary Studies
SUBMISSION TYPE:	Revision
ACTION:	APPROVAL/VERIFICATION OF EXEMPT STATUS
DECISION DATE:	December 20, 2019
EXPIRATION DATE:	December 20, 2023

Thank you for your submission of Revision materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Nicole Morse at 970-351-1910 or nicole.morse@unco.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.

24/10/20 21:14

Fw: Project Number 1510195-2: Requesting a change to Interviewee Consent Form

Moradian, Ann <mora3441@bears.unco.edu>
Sat 8/15/2020 6:23 AM
To: perspectivesinmotion@gmail.com <perspectivesinmotion@gmail.com>

2 attachments (173 KB)
3-AnnMoradian-IRB-Consent Form-Interview-Revised-202000813.docx; 1-AnnMoradian-IRB Narrative-Revision-20200722.docx;

From: Morse, Nicole <Nicole.Morse@unco.edu>
Sent: Thursday, August 13, 2020 12:35 PM
To: Moradian, Ann <mora3441@bears.unco.edu>
Cc: Minton, Sandra <Sandra.Minton@unco.edu>
Subject: RE: Project Number 1510195-2: Requesting a change to Interviewee Consent Form

Perfect! Thank you for making that change, Ann. Please accept this email as approval of your modification request to proceed with the changes as you outlined in your attachments. If you need a formal approval letter, please let me know. Otherwise, just keep this email as part of your research records. You are free to proceed.

Thank you and best of luck as you continue your project!

Nicole Morse, CIP
Research Compliance Manager
Office of Research & Sponsored Programs

During the UNC Covid-19 campus closure, UNC's Office of Research and Sponsored Programs will continue with normal operations working remotely, with the exception of the Animal Research Facility. ORSP staff working remotely have forwarded their office phones to personal phones and should be reachable by calling their office phone numbers as well as via email and Teams chat.

UNC | UNIVERSITY OF NORTHERN COLORADO
Carter 2008 | Campus Box 143 | Greeley, CO 80639
O: 970-351-1910 | F: 970-351-1934
Join the ORSPnews listserv! Email orsp@unco.edu to subscribe.

CONSENT FORM FOR NON-DANCE PARTICIPANTS' SURVEY QUESTIONNAIRE
UNIVERSITY OF NORTHERN COLORADO

Project Title: Missing in Action - Locating the Body in Interdisciplinary Studies
Researcher: Ann Lenore Moradian, candidate in the Dance Education MA, School of Theatre & Dance, Extended Studies

Phone: xxx-xxx-xxxx E-mail: mora3441@bears.unco.edu
Advisor: Dr. Sandra Minton E-mail: sandra.minton@unco.edu

Purpose and Description: This research seeks to identify which disciplines (outside of movement-based practices, like dance or athletics) are engaged with ideas or conducting research that relate to embodiment, the human body, its movement, processes or 'body studies' in an attempt to understand the different ways the human body and its movement are currently considered, integrated and studied across multiple disciplines. For the purpose of this questionnaire, the term 'body studies' refers to the broad range of research about, from and through the body, whether by focusing directly on or interacting directly with the body, its parts, processes, systems, or by focusing on less direct aspects connected to the body, such as identity, creativity, behavior, transfer of knowledge, etc. The aim is understand how the human body and embodied being is currently considered, integrated and studied across multiple disciplines. This may help reveal potential gaps and synergies for interdisciplinary research and partnerships. Your participation will help in better understanding how your field relates to and engages in body- and movement-related inquiry.

This process involves filling out an online survey questionnaire on Qualtrics online survey platform. This survey questionnaire will ask for basic information about you and your work, along with a series of yes/no, multiple choice, scaled response, and open-ended questions. These questions will be focused on the relationship your field has to the body, information related to the body, or its movement. It will also include a few personal questions about the way body- or movement-based discoveries have affected you in your work and perspectives, and how you perceive the relationship between body and mind. It is estimated that this questionnaire will take 15-20 minutes to complete.

Data Handling and Confidentiality: The final thesis resulting from this research will be available to you on request, after its completion in December 2020. I will take every precaution to protect your confidentiality. You will be assigned a subject number, and I will be the only person who will know the name connected with that subject number. When I report or write about data from this research, your name will not be used. Data collected and analyzed for this study will be kept in a locked cabinet in my home office or on a password protected computer. All data and consent forms will be destroyed after three years.

Risks, Benefits & Compensation: Potential risks in this project are minimal. If there are any questions you would prefer not to answer, or find unclear, you are not required to answer them. Those most likely to benefit from this research are those who are engaged in research and other work concerning the body, whether directly or indirectly. There is no compensation proposed for participating in this project.

Voluntary Agreement to Participate: Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Please take your time to read and thoroughly review this document and decide whether you would like to participate in this research study. If you decide to participate, your completion of the research procedures indicates

your consent. Please keep or print this form for your records. If you have any concerns about your selection or treatment as a research participant, please contact Nicole Morse, Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910.

CONSENT FORM FOR MOVEMENT-PRACTITIONERS' SURVEY QUESTIONNAIRE IN UNIVERSITY OF NORTHERN COLORADO

Project Title: Missing in Action - Locating the Body in Interdisciplinary Studies

Researcher: Ann Lenore Moradian, candidate in the Dance Education MA, School of Theatre & Dance, Extended Studies

Phone: xxx-xxx-xxxx E-mail: mora3441@bears.unco.edu
Advisor: Dr. Sandra Minton E-mail: sandra.minton@unco.edu

Purpose and Description: This research explores what body- or movement-related inquiries are currently underway across the disciplines, with the aim of identifying gaps and potential synergies for interdisciplinary research and partnerships. As a movement-based practitioner, your participation will help in understanding what kind of skills and knowledge can be developed or acquired through movement-based or embodied practice, and how they can be applied outside of the practice space.

This process involves filling out an online questionnaire on Qualtrics online survey platform. This survey questionnaire will ask multiple choice, yes/no, scaled response, and open-ended questions. It will also include some basic questions about you, your work, the skills, capabilities and knowledge you have gained through your work as a movement or dance expert, how you apply some of these skills in your life, and how you perceive the relationship between body and mind. Completing this questionnaire will take approximately 25 minutes.

Data Handling and Confidentiality: The final thesis resulting from this research will be available to you on request, after its completion in December 2020. I will take every precaution to protect your confidentiality. You will be assigned a subject number, and I will be the only person who will know the name connected with that subject number. When I report or write based on the data from this research, your name will not be used. Data collected and analyzed for this study will be kept in a locked cabinet in my home office or on a password protected computer. All data and consent forms will be stored for three years, at which time they will be destroyed.

Risks & Benefits & Compensation: Potential risks in this project are minimal. If there are any questions you would prefer not to answer, or find unclear, you are not required to answer them. Those most likely to benefit from this research are those who are engaged in research and other work concerning the body, whether directly or indirectly. There is no compensation proposed for this participating in this project.

Voluntary Agreement to Participate: : Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Please take your time to read and thoroughly review this document and decide whether you would like to participate in this research study. If you decide to participate, your completion of the research procedures indicates your consent. Please keep or print this form for your records. If you have any concerns about your selection or treatment as a research participant, please contact Nicole Morse, Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910.

CONSENT FORM FOR PARTICIPANTS' INTERVIEWS
UNIVERSITY OF NORTHERN COLORADO

Project Title: Missing in Action - Locating the Body in Interdisciplinary Studies

Researcher: Ann Lenore Moradian, candidate in the Dance Education MA,
School of Theatre & Dance, Extended Studies

Phone: xxx-xxx-xxxx E-mail: mora3441@bears.unco.edu
Advisor: Dr. Sandra Minton E-mail: sandra.minton@unco.edu

Purpose and Description: I am trying to identify which disciplines are engaged with ideas and in research that concerns the human body, information related to the body, its processes, or its movement in an attempt to understand the different ways the human body and its movement are currently considered, integrated and studied across multiple disciplines. My aim is explore the range of inquiries currently underway, and to identify gaps and potential synergies for interdisciplinary research and partnerships. Your participation will help me understand how your field relates to, engages with, or learns from body- and movement-related inquiry.

You will be asked to participate in an interview that includes questions focused on your field's relationship to the body, its movement, and how or what we learn from or through it. Space and time will also be created for more free-flowing dialogue. In-person interviews and interviews via telephone or WhatsApp will be audio recorded; interviews taking place online will be recorded by the online platform's recording option (i.e., ZOOM, Skype). Written responses are also welcome. It is estimated that this process will take approximately 45 minutes.

Data Handling and Confidentiality: The final thesis resulting from this research will be available to you on request, after its completion in December 2020. Please indicate by checking that you:

- ☐ would prefer your identity remain confidential;
- ☐ are willing to have your name cited as an interviewee,
- ☐ are willing to have your interview material saved for possible future use (which would require your agreement and signature allowing for that specific use at that future time).

If you wish to remain unidentified: I will take every precaution to protect your confidentiality. You will be assigned a subject number, and I will be the only person who will know the name connected with that subject number. When I report data, your name will not be used. Data collected and analyzed for this study will be kept in a locked cabinet in my home office or on a password protected computer. All data and consent forms will be stored for three years, at which time they will be destroyed.

Risks & Benefits & Compensation: Potential risks in this project are minimal. If there are any questions you would prefer not to answer, or find unclear, you are not required to answer them. Those who are most likely to benefit from this research are those who are engaged in research and other work related to the human body and/or its movement, whether this is a direct or indirect engagement. There is no compensation proposed for participating in this project.

Voluntary Agreement to Participate: Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Please take your time to read and thoroughly review this document and decide whether you would like to participate in

this research study. If you decide to participate, your completion of the research procedures indicates your consent. Please keep or print this form for your records. If you have any concerns about your selection or treatment as a research participant, please contact Nicole Morse, Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910.

Subject's Signature Date

Researcher's Signature Date

APPENDIX B

RESEARCH INSTRUMENTS

Missing in Action: Locating the Body in Interdisciplinary Studies

RECRUITMENT WORDING
For Interdisciplinary Interviews

Interdisciplinary Interview Letter:
Dear xxxxx,

(Xxxx Xxxx suggested I contact you.) I am doing a research project for my Masters degree in Dance Education, exploring how and what we learn from and through the human body and its movement across disciplines. A key piece of this research is to understand which disciplines (other than movement-based practices such as dance or athletics) are engaged with ideas or research that relate to embodiment, the broad topic of 'body studies,' or human movement and in what ways they are related to or integrated in your discipline or field.

(*Note: For the purpose of this research, 'body studies' refers to* research about, from or through the body – whether through a direct focus and engagement with the body, its parts, processes, systems, or movement or indirectly (such as identity, creativity, behavior, communication, transfer of knowledge, etc.).

My aim is to help identify trends, gaps and potential synergies in interdisciplinary research, and help facilitate communication, cooperation and collaboration across disciplines.

I would like to learn more about how your field currently considers and relates to the living body, and wonder if you would be willing to be interviewed for this project. This should take about 45 minutes, and could be organized in-person, by ZOOM, Skype, WhatsApp, or telephone. Is this something you might be able to make time for over the next month?

If you would be willing to participate in this research, or have any questions, please contact me (Ann Moradian) at perspectivesinmotion@gmail.com. I will be delighted to hear from you, and most grateful for your help with this project!

Thanking you,
Sincerely,
Ann Moradian

Interdisciplinary Interview Phone Call:
Good morning.

My name is Ann Moradian. (Xxxx Xxxx suggested I contact you.) I am doing a research project for my Masters degree in Dance Education, exploring which disciplines (other than movement-based practices) are engaged with ideas or research that relate to embodiment or the broad topic of 'body studies.'

(*Note: If they ask about what 'body studies' means, I would explain that it is:* research about, from or through the body – this could be through a direct focus and engagement with the body, its parts, processes, systems, or movement; or it could be a less direct interaction with the living body that focuses on things like identity, creativity, behavior, communication, transfer of knowledge, etc.)

I would like to better understand your field's relationship to the body, its movement, and how or what we learn from or through it. I am hoping this project will help identify trends, gaps and potential synergies in interdisciplinary research, and help facilitate communication and collaboration across disciplines.

Would you be willing to be interviewed for this project? (It should take about 45 minutes, and we could connect in-person, by ZOOM, Skype, WhatsApp, telephone.)

For Interdisciplinary Questionnaire

Interdisciplinary Questionnaire Letter:
Dear xxxxx,

(Xxxx Xxxx suggested I contact you.) I am doing a research project for my Masters degree in Dance Education, exploring how and what we learn from and through the body and its movement across disciplines. A key piece of this research is to understand which disciplines (other than movement-based practices like dance or athletics) are engaged with ideas or research that relate to embodiment or the broad topic of 'body studies,' and in what ways.

(*Note: For the purpose of this research, 'body studies' refers to* research about, from or through the body – whether through a direct focus and engagement with the body, its parts, processes, systems, or movement, or indirectly (such as identity, creativity, behavior, communication, transfer of knowledge, etc.).

My aim is to help identify trends, gaps and potential synergies in interdisciplinary research, and help facilitate communication, cooperation and collaboration across disciplines.

I am looking to for professionals, teachers, researchers, and other experts in the various fields to respond to an online survey questionnaire. The questionnaire should take about 20 minutes to complete. (The survey asks basic questions about you, your work, and the relationship your field has to the body, its processes or movement. It will also include a few personal questions about the way body-or movement-based discoveries have affected you in your work and perspectives, and how you perceive the relationship between body and mind.) Do you think you could make time to do this in the coming week? I would be most grateful for your help with this project!

If you would be willing to participate in this research, or have any questions, please contact me (Ann Moradian) at perspectivesinmotion@gmail.com. I will be delighted to hear from you, and most grateful for your help with this project!

Thanking you,
Sincerely,
Ann Moradian

PS – It would be extremely helpful, also, if you could share this information among your colleagues and communities.

Interdisciplinary Questionnaire Phone Call:
Good morning.

My name is Ann Moradian. (Xxxx Xxxx suggested I contact you.) I am doing a research project for my Masters degree in Dance Education, trying to identify which disciplines (other than movement-based

practices) are engaged with ideas or research that relate to embodiment or the broad topic of 'body studies.'

(*Note: If they ask about what 'body studies' means, I would explain that it is:* research about, from or through the body – this could be through a direct focus and engagement with the body, its parts, processes, systems, or movement; or it could be a less direct interaction with the living body that focuses on things like identity, creativity, behavior, communication, transfer of knowledge, etc.)

I am hoping this project will help identify trends, gaps and potential synergies in interdisciplinary research, and help facilitate communication and collaboration across disciplines.

I am wondering if you would be willing to respond to an online questionnaire that should take about 20 minutes to complete. (The survey asks basic questions about you, your work, and the relationship your field has to the body, its processes or movement. It will also include a few personal questions about the way body-or movement-based discoveries have affected you in your work and perspectives, and how you perceive the relationship between body and mind.) Do you think you could make time to do this in the coming week?

For Movement Practitioner Interviews

Movement Practitioner Interviews Letter:
Dear xxxxx,

(Xxxx Xxxx suggested I contact you.) I am doing a research project for my Masters degree in Dance Education, exploring how and what we learn from and through the body across disciplines. A key piece of this research is to understand the kinds of knowledge, skills and capabilities embodied movement experts already are, or might be able to contribute to these discussions and research.

My aim is to help identify trends, gaps and potential synergies in interdisciplinary research, and help facilitate communication, cooperation and collaboration across disciplines.

I would be grateful to have an opportunity to learn more about what you see happening in you field, and how you see this work related to other disciplines (such as science, medicine, technology, or the humanities). I wonder if you would be willing to be interviewed for this project. This should take about 45 minutes, and could be organized in-person, by ZOOM, Skype, WhatsApp, or telephone. Is this something you might be able to make time for over the next month?

If you would be willing to participate in this research, or have any questions, please contact me (Ann Moradian) at perspectivesinmotion@gmail.com. I will be delighted to hear from you, and most grateful for your help with this project!

Thanking you,
Sincerely,
Ann Moradian

Movement Practitioner Interviews Phone Call:
Good morning.

My name is Ann Moradian. (Xxxx Xxxx suggested I contact you.) I am doing a research project for my Masters degree in Dance Education, exploring what kinds of body- or movement-related inquiries are currently underway across different disciplines, and what kinds of knowledge, skills and capabilities

movement experts already are, or might be able to contribute to these discussions and research. I am hoping this project will help identify trends, gaps and potential synergies in interdisciplinary research, and help facilitate communication and collaboration across disciplines.

Would you be willing to be interviewed for this project? (It should take about 45 minutes, and we could connect in-person, by ZOOM, Skype, WhatsApp, telephone.)

For Movement Practitioner Questionnaire

Movement Practitioner Questionnaire Letter:
Dear xxxxx,

(Xxxx Xxxx suggested I contact you.) I am doing a research project for my Masters degree in Dance Education, exploring how and what we learn from and through the body across disciplines. My aim is to help identify trends, gaps and potential synergies in interdisciplinary research, and help facilitate communication, cooperation and collaboration across disciplines.

I am looking for movement practitioners with at least 10 years of practice-based experience to participate in an online survey that inquires into the kinds of knowledge, skills and capabilities we develop over the years through our practice-based work. I am hoping this survey will help identify what we, as movement experts might be able to contribute to the interdisciplinary research and discussions taking place today that concern the body, but which often do not include movement experts.

The questionnaire should take about 30 minutes to complete. It asks basic questions about you, your work, the skills and knowledge you have gathered as a movement practitioner, how you apply some of these skills in your life, and how you perceive the relationship between body and mind. Some of the questions are simple yes/no questions, some are multiple-choice, some are scaled response, and some are open-ended. I would be most grateful for your help with this project!

If you would be willing to participate in this research, or have any questions, please contact me (Ann Moradian) at perspectivesinmotion@gmail.com. I will be delighted to hear from you, and most grateful for your help with this project!

Thanking you,
Sincerely,
Ann Moradian

PS – It would be extremely helpful, also, if you could share this information among your colleagues and larger communities of experienced movement practitioners.

Movement Practitioner Questionnaire Phone Call:
Good morning.

My name is Ann Moradian. (Xxxx Xxxx suggested I contact you.) I am doing a research project for my Masters degree in Dance Education, exploring what kinds of body- or movement-related inquiries are currently underway across different disciplines, and what kinds of knowledge, skills and capabilities movement practitioners might be able to contribute to these discussions and research. I am hoping this project will help identify trends, gaps and potential synergies in interdisciplinary research, and help facilitate communication and collaboration across disciplines.
I am wondering if you would be willing to respond to an online questionnaire that should take about 30 minutes. The survey asks basic questions about you, your work, the skills and knowledge you have

gathered as a movement practitioner, how you apply some of these skills in your life, and how you perceive the relationship between body and mind. Some of the questions are simple yes/no questions, some are multiple-choice, some are scaled response, and some are open-ended. Do you think you could make time to do this in the coming week?

Missing in Action: Locating the Body in Interdisciplinary Studies

INTERDISCIPLINARY QUESTIONNAIRE

Participant #: _____

If you have any questions, or would like to be sent the results of this research, please contact:
Ann Moradian (perspectivesinmotion@gmail.com)

→ *You can save your answers on this questionnaire and return to it later, if you need or wish.*

→ *If any question is unclear, not applicable, or you do not wish to answer it, please type in "**N/A**" (or skip) and continue.*

Part A: Please provide some basic information about yourself

1. Your discipline: _____
   - □ Agriculture
   - □ Anthropology
   - □ Architecture
   - □ Biology
   - □ Business
   - □ Chemistry
   - □ Cultural Studies
   - □ Communications, Media, Journalism
   - □ Computer Science
   - □ Design
   - □ Earth Sciences
   - □ Ecology / Environment
   - □ Economics
   - □ Education
   - □ Engineering
   - □ Geography
   - □ Geology
   - □ Language, Linguistics
   - □ Law
   - □ Library and Museum Studies
   - □ Literature
   - □ Mathematics
   - □ Medicine
   - □ Military
   - □ Neuroscience
   - □ Organizational Studies
   - □ Performing Arts
   - □ Philosophy
   - □ Physics
   - □ Political Science
   - □ Psychology

□ Public Administration
□ Religion & Spiritual Studies
□ Sociology
□ Space Sciences
□ Systems Sciences
□ Technology
□ Transportation
□ Visual Arts

□ Other _____

Your field(s) / specialization(s): _____

_____

Examples: Discipline: *Communications* Field: *Semiotics*
Discipline: *Psychology* Field: *Trauma*

a. Number of years in this discipline: _____ *(scale slider used)*

b. Employed by an institution?

□ Yes → How many years in an institutional setting? _____ *(scale slider used)*
□ No

2. What is your level of education?

□ High School
□ Bachelor's degree
□ Master's degree
□ Doctoral degree
□ Other _____

_____

3. What is your age? _____ *(slider used to indicate number)*

4. What country or countries have you lived in for more than three years?

_____

_____

_____

_____

_____

5. What is your gender?

   □ Female
   □ Male
   □ Other

6. What do you find the most interesting or exciting about or in the work you do?

   _____

   _____

   _____

7. In your work, what do you find the most perplexing or challenging?

   _____

   _____

   _____

8. What do you appreciate the most about the work you do?

   _____

   _____

   _____

9. Do you, or does your field conduct research across disciplines?

   □ No
   □ Yes

   a. If *Yes,* with which other disciplines?

      _____

      _____

      _____

   b. In general, do you believe the other discipline(s) need your field's contribution to this work?

      □ Yes
      □ No *(added "Not Sure" option)*

c. In general, do you believe your field needs the other discipline's contribution to this work?

□ Yes
□ No *(added "Not Sure" option)*

d. What challenges have you encountered in this type of collaborative venture?

_____

_____

_____

_____

_____

_____

e. How is this research financed?

□ University funding
□ Foundation funding
□ Government funding
□ Corporate funding
□ Corporate social investing
□ Nonprofit funding
□ Individuals / crowd funding
□ Other: _____

10. Do you, or does your field, study or conduct research related *directly* to the human body, its movement, or 'body studies" (i.e., research about, from, through, on and/or with the body, its parts, processes, systems, etc.)?

□ No
□ Yes → Please describe: _____

_____

_____

_____

_____

_____

11. Do you or does your field study or conduct research related to the human body, its movement or 'body studies' *indirectly* (i.e., transfer of knowledge, identity, behavior, etc.)?

    □ No
    □ Yes → Please describe: _____

    _____

    _____

    _____

    _____

12. Please use the cursor to choose the image-that best portrays your field's relation with the human body (or describe your own image in the text box below).

    (*In the figures, the large circle would represent your discipline or field, and the small dark circle would represent the body, its movement, 'body studies,' etc. So, Figure 6 would signify that the body is one among other things of study or consideration within your field, where Figure 5 would imply that the body is the central focus in your field.)*

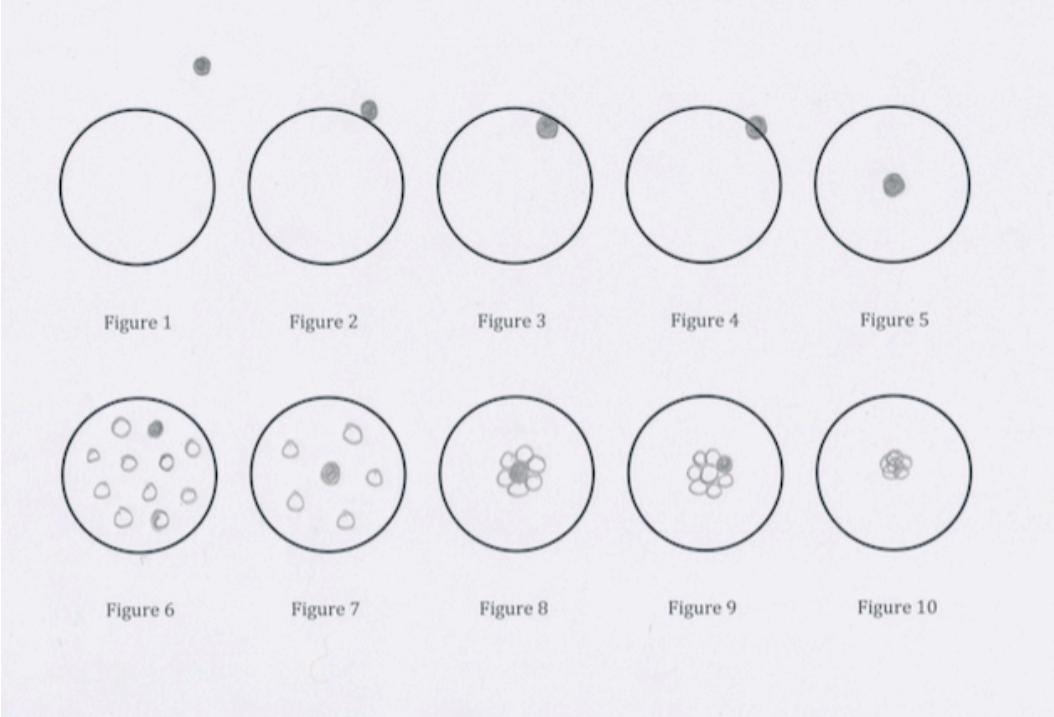


Image: Ann Moradian 2019. Inspired by by A.R. Jensenius https://www.arj.no/2012/03/12/disciiplinarities-2/

If you prefer, describe your own image here:

_____

_____

_____

_____

_____

13. On a scale of 1 to 5, where would you place the importance of the human body, its movement, or 'body studies' within your field?

1_____2_____3_____4_____5___

Importance: None Very little Some Significant Great

→ *If the human body, its movement and / or 'body studies' have ANY degree of importance in your field,* ***please continue to Part B:***

→ *If the human body, its movement or 'body studies' have NO importance in your field, you are done.*

Before signing off, if you have anything you would like to add, or any comments you would like to make, please do so here:

_____

_____

_____

_____

_____

_____

Missing in Action: Locating the Body in Interdisciplinary Studies

INTERDISCIPLINARY QUESTIONNAIRE

Part B:

1. If your field conducts research related to the human body, its movement, or 'body studies,' how does it do this? (*Please check all that apply*)

    a. Theoretically (*please describe or elaborate*): _____

    _____

    b. Through technology (*please describe or elaborate*): _____

    _____

    c. Experientially (*please check all that apply*):

    □ Human studies
    □ Animal studies
    □ In controlled laboratory settings
    □ In natural settings
    □ Other (please describe or elaborate): _____

    _____

    _____

2. In your field, where do you get your information about the human body, or its movement? (*Please check all that apply):*

    □ Directly through your own body

    □ Indirectly from or through the bodies of others
    □ Through lecture-style classes
    □ Through embodied, participatory practice or classes
    □ From books, journals or publications
    □ Other (please specify): _____

3. If research related to the human body, its movement, or 'body studies' is a relatively new area of interest to your field, why this interest now?

    _____

    _____

    _____

    _____

4. What do you see as the most significant *inquiry* or *area of research* in your work today related to the human body/being, movement, or 'body studies'?

_____

_____

_____

_____

5. Please note the most difficult challenge(s) you are confronted with in your work that concerns the human body, 'body studies,' or human movement:

_____

_____

_____

_____

6. To what degree has any research or findings relating to the human body, its movement or body-related studies affected your perception (i.e., in relation to your work, your life, your body, your relationships, etc.)?

1_____2_____3_____4_____5

Degree of Change: None A little Some Significant Great

Please elaborate or comment (i.e., what findings, in which field, how did this change your perception?):

_____

_____

_____

7. During the course of your day, when are you most aware of your body, or its movement?

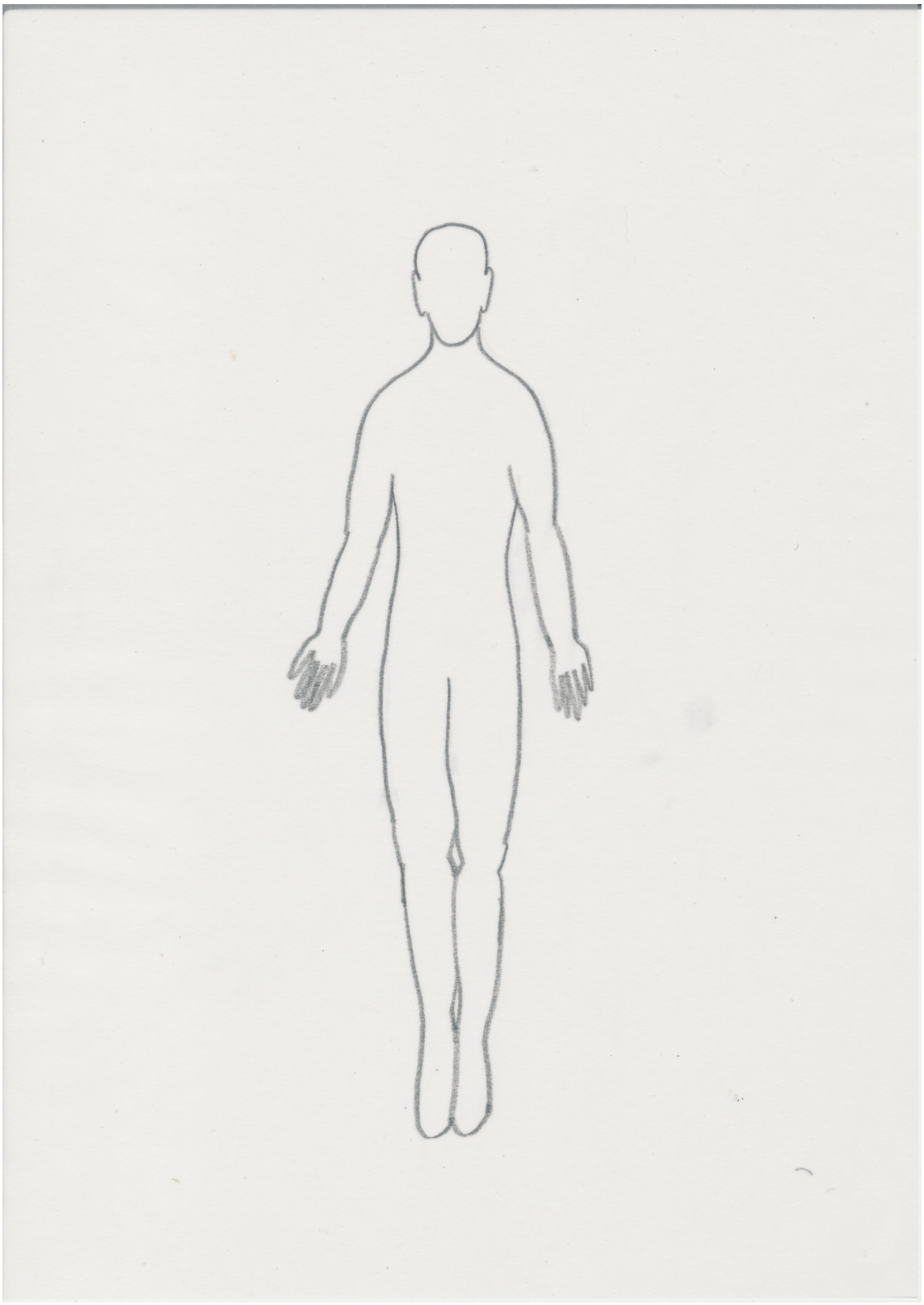
_____

_____

_____

_____

8. Using the image below to represent your body, highlight with the cursor where you feel your mind resides (or describe in the following text box):



If you prefer, describe your own image here:

_____

_____

9. What relationship do you usually experience between mind, body and environment? *You are welcome to select from the nine images below, or describe your own image in the following text box.*

Image 1

Image 2

Image 3

Image 4

Image 5

Image 6

Image 7

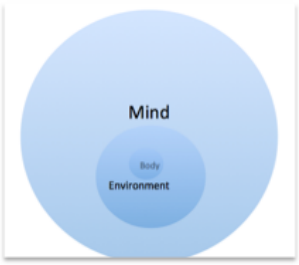


Image 8

Image 9

Image: Ann Moradian, 2019, based on 'Inclusion-of-Other-in-the-Self-Scale' from Aron 1992.

If you prefer, describe your own image here:

_____

_____

_____

10. How does the institution or culture that you work in understand the relationship between mind, body and environment? *You are welcome to select from the nine images below, or describe your own image in the following text box.*

Image 1

Image 2

Image 3

Image 4

Image 5

Image 6

Image 7

Image 8

Image 9

Image: Ann Moradian, 2019, based on 'Inclusion-of-Other-in-the-Self-Scale' from Aron 1992.

If you prefer, describe your own image here:

_____

_____

If you have any comments you would like to add, please do so here:

_____

_____

_____

That concludes this research survey.
Thank you very much for your participation!

Missing in Action: Locating the Body in Interdisciplinary Studies

MOVEMENT PRACTITIONER QUESTIONNAIRE

Participant #: _____

If you have any questions, or would like to be sent the results of this research, please contact: Ann Moradian (perspectivesinmotion@gmail.com)

→ *You can save your answers on this questionnaire and return to it later, if you need or wish.*

→ *If any question is unclear, not applicable, or you do not wish to answer it, please type in "**N/A**" (or skip) and continue.*

Part A: Discipline and Skills

14. Your discipline:
    - □ Athletics, Sports & Fitness
    - □ Dance
    - □ Martial & Energy Arts
    - □ Somatics
    - □ Other _____

    Your field(s) / specialization(s): _____

    _____

    Examples: Discipline: *Dance* Field: *Improvisation (Gaga, Contact)*
    Discipline: *Athletics* Field: *Hockey*

    a. Number of years in this discipline: _____
    (used scale slider to indicate number)

    b. Are you an independent practitioner? Y / N

    c. Are you employed by an institution?

    □ Yes → How many years in an institutional setting? _____
    (used scale slider to indicate number)
    □ No

15. What is your level of education?

    - □ High School
    - □ Bachelor's degree
    - □ Master's degree
    - □ Doctoral degree
    - □ Other (please specify) _____

16. What is your age? _____ *(used scale slider to indicate number)*

17. What country or countries have you lived in for more than three years?

    Country 1 _____

    Country 2 _____

    Country 3 _____

    Country 4 _____

    Country 5 _____

    Country 6 _____

    Country 7 _____

18. What is your gender?

    □ Female
    □ Male
    □ Other

19. *Because movement practitioners rely primarily on practice and experience for the acquisition of knowledge and capabilities – often without explicit language to identify them – it is possible that we do not know what we know.* Please rate the skills, capacities, and abilities you feel you have developed through your work as a movement or embodied practitioner on a scale of 0 to 5. These skills or capacities are grouped under six headings, even though many could fit under more than one category:

I. ENHANCED AWARENESS:	**Please rate on a scale of 0–5 with 0=none and 5=strong**
Spatial awareness	
Contextual awareness	
Temporal awareness	
Sensorial awareness	
Physical awareness	
Internal awareness	
Awareness of gravity	
Awareness of bodies in space	
Awareness of formal relationships	
Awareness of dynamics in relationships	
Awareness of emotion in relationships	
Awareness of the relations between viewer and viewed	
Awareness of ‘invisible’ movement or subtle states of being	
Layered attentional awareness	

"Environmental" awareness (i.e., natural environment, pyscho-emotional environment, etc.)	

Other (please list): _____

List up to three of these types of awareness that you consider to be the most useful or important in your daily life. Please explain, comment or elaborate:

- _____

- _____

- _____

II. PERSONAL SKILLS, CAPACITIES OR QUALITIES:	**Please rate on a scale of 0–5 with 0=none and 5=strong**
Focus and concentration	
Self-discipline or self-regulation	
Grit and determination (willpower)	
Courage	
Integrity	
Reliability	
Confidence	
Adaptability	
Curiosity	
Mental agility	
Willingness to learn	
A positive attitude or outlook	
Solution orientation	
'Resilience'	
Ability to manage one's own strong emotions (emotional stability)	
Compassion	
Comfortable making decisions	
Comfortable with change	
Ability to tolerate ambiguity and uncertainty	
Ability to meet the unknown with relative ease or creative response	
Ability to perform or stay focused under pressure	
Comfortable in front of an audience	
Critical thinking	
Intuition	

Other (please list): _____

List up to five of these personal skills, capacities or qualities that you consider the most useful, or have the most significant effect in your daily life. Please explain, comment or elaborate:

- _____

- _____

- _____

- _____

- _____

III. INTERPERSONAL SKILLS, ABILITIES:	**Please rate on a scale of 0–5 with 0=none and 5=strong**
Non-verbal communication skills (both reading and expressing)	
Emotional intelligence	
Empathy	
Deep listening skills	
Physical empathy	
Psycho-physical intelligence	
Ability to communicate comfortably with diverse types of people	
Ability to create or communicate meaning	
Ability to motivate or inspire others	
Ability to respond constructively to other's strong emotions	
Ability to respond constructively to inappropriate behavior	
Negotiation skills	
Conflict Resolution	
Consensus building	
Team building	

Other (please list): _____

List up to three of these interpersonal skills or abilities that you consider the most useful, or have the most significant effect in your daily life. Please explain, comment or elaborate:

- _____

- _____

- _____

IV. CREATIVE SKILLS OR ABILITIES:	**Please rate on a scale of 0–5 with 0=none and 5=strong**
Imagination	
Creativity or ingenuity	
Improvisational facility	
Ability to express or communicate through the body	
Artistic expression	
Abstract expression	

Use of metaphor	
Use of imagery	
Spatial design	
Formal design (shape)	
Textural design	
Design of dynamics	
Temporal design	
Organic design	
Ability to design experience	
Ability to convey a story	
Rhythmic coordination or organization	
Musicality	
Ability to create or decipher meaning, sense, order	
Ability to discern or predict possibility	
Able to give constructive feedback	
Ability to receive criticism	
Thinking outside the box	
Use of Color	

Other (please list): _____

List up to five of these creative skills or abilities that you consider the most useful, or have the most significant effect in your daily life. Please explain, comment or elaborate:

- _____

- _____

- _____

- _____

- _____

V. ORGANIZATIONAL SKILLS AND ABILITIES:	**Please rate on a scale of 0–5 with 0=none and 5=strong**
Ability to prioritize	
Multi-tasking ability	
Solution-oriented problem solving	
Time management	
Ability to meet deadlines successfully	
Ability to assess strengths and weaknesses	
Goal orientation	
Ability to identify root issues or problems	
Ability to delegate responsibility	
Process management	
Production management	
Event management	

Marketing skills	

Other (please list): _____

List up to three of these organizational skills or abilities that you consider the most useful, or have the most significant effect in your daily life. Please explain, comment or elaborate:

- _____

- _____

- _____

VI: MOVEMENT & PHYSICAL SKILLS:	**Please rate on a scale of 0–5 with 0=none and 5=strong**
Strength	
Flexibility	
Stamina	
Control	
Coordination	
Balance / steadiness	
Movement precision	
Movement efficiency	
Physical articulation	
Physical agility	
Physical intelligence	
Movement literacy	
Overall physical health	
Cardiovascular health	
Strong immune system	
Psycho-emotional health and well-being	

Other (please list): _____

List up to three of these movement or physical skills or strengths that you apply in your life, or you see as having a noteworthy effect in your life. Please explain, comment or elaborate:

- _____

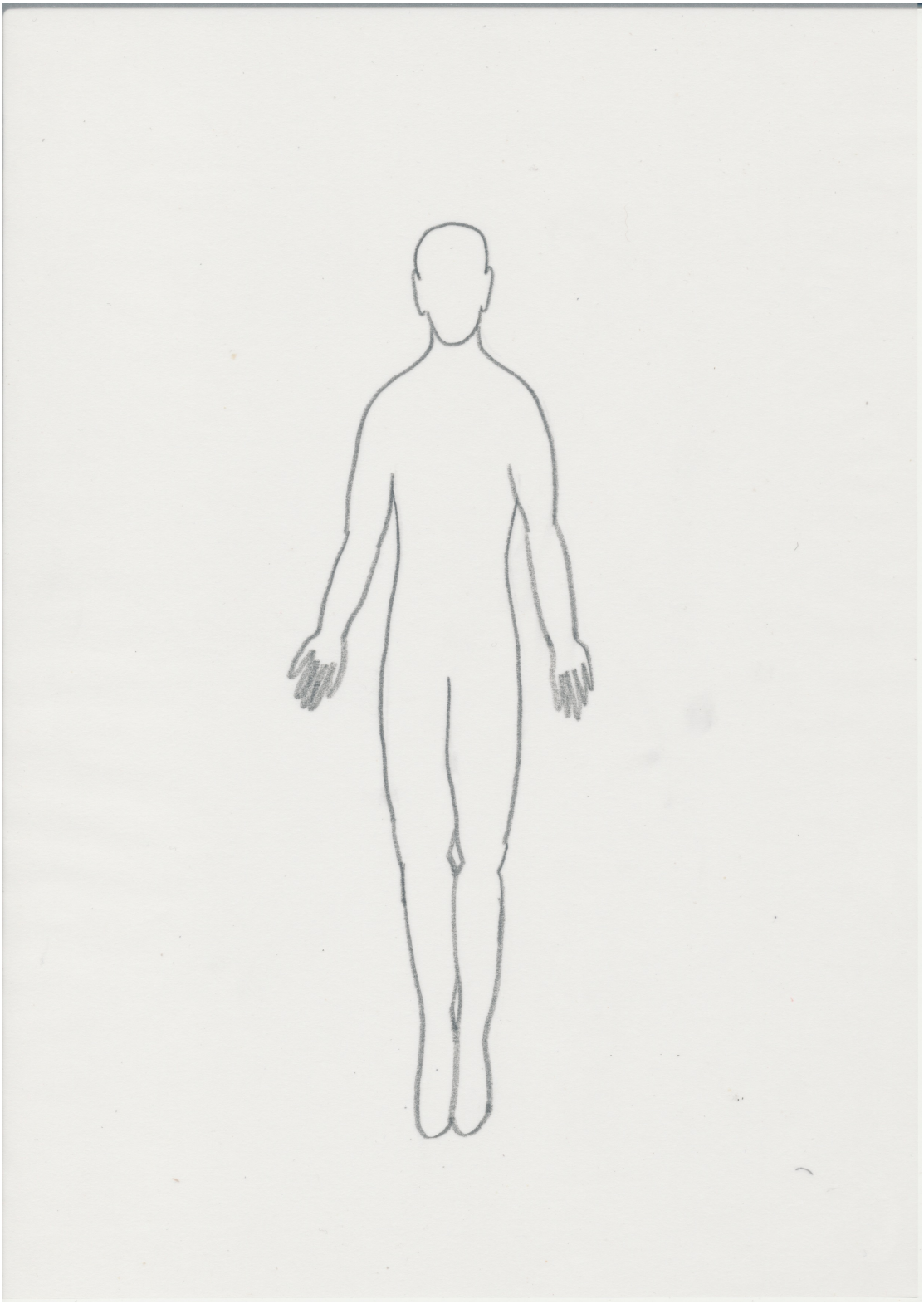
- _____

- _____

Part B: Further Reflection

Because movement practitioners rely on and engage with the body regularly, it is of interest to understand how they perceive the relationship between mind, body and environment.

1. Using the image below to represent your body, use the cursor to highlight (or describe in the text box below) where you feel your mind resides?



2. What relationship do you usually experience between mind, body and environment? *You are welcome to use the cursor to select from the nine images below, or describe your own image in the text box below.*

Image 1

Image 2

Image 3

Image 4

Image 5

Image 6

Image 7

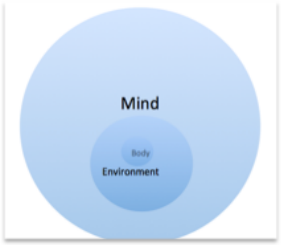


Image 8

Image 9

Image: Ann Moradian, 2019, based on 'Inclusion-of-Other-in-the-Self-Scale' from Aron 1992.

3. How does the institution or culture that you work in understand the relationship between mind, body and environment? *You are welcome to use the cursor to select from the nine images below, or describe your own image in the text box below.*

Image 1

Image 2

Image 3

Image 4

Image 5

Image 6

Image 7

Image 8

Image 9

Image: Ann Moradian, 2019, based on 'Inclusion-of-Other-in-the-Self-Scale' from Aron 1992.

4. What are you aware of directly, and also indirectly, as you engage in your movement form or practice?
    a. On a body level:
        □ gravity
        □ weight
        □ balance
        □ form
        □ spatial relation
        □ other: _____

        _____

    b. On a movement level?
        □ energy
        □ quality
        □ texture
        □ dynamics
        □ momentum
        □ control
        □ other: _____

        _____

    c. On a sensory level?
        □ ease
        □ strain
        □ pain
        □ physical harmony (flow)
        □ air
        □ humidity
        □ heat
        □ cold
        □ sound (like music, directions, breath, applause)
        □ other

    d. Environment?
        □ others directly involved in the movement practice
        □ others not directly involved in the movement practice
        □ temperature
        □ weather conditions
        □ safety and potential hazards
        □ other

    e. Emotions?
        □ your own
        □ those of others
        □ other

f. Imagery?
□ that is given, or directly relevant to the task at hand
□ that is not obviously or directly related to the task at hand
□ other

g. Insights, intuitions, revelations?
□ No
□ Yes
If yes, without going into detail, please comment briefly on what these have been related to: _____

_____

_____

5. Do these levels of awareness differ in a practice setting and in a "performance" setting?
   a. □ Yes
   b. □ No

6. Do these levels of awareness carry over into your daily life?
   a. □ Yes
   b. □ No

Part C: Personal Perspectives

1. In the work you do, what do you find to be the most challenging or perplexing?

_____

_____

_____

2. In the work you do, what do you find the most engaging, fascinating, exciting or interesting?

_____

_____

_____

3. What is the most useful thing you have gained from your movement-based practice?

_____

_____

_____

4. What do you consider the most important or valuable contribution your field or discipline brings to the individual engaged in movement practice?

_____

_____

_____

5. What do you consider the most important or valuable contribution your field or discipline brings to the educational process?

_____

_____

_____

6. What do you consider the most important or valuable contribution your field or discipline brings to the world? _____

_____

_____

_____

7. What do you consider the most important or valuable contribution *you* bring to the world through your work in the field of movement-based practice?

_____

_____

_____

8. What do you admire or respect most in others in your field?

_____

_____

_____

9. What understanding from your field or discipline do you most wish were understood or adopted by those outside of your field?

_____

_____

_____

That concludes this research survey.
Thank you very much for your participation in this research project!

If you have any comments you would like to add, please do so here:

_____

_____

_____

_____

Missing in Action: Locating the Body in Interdisciplinary Studies

INTERDISCIPLINARY INTERVIEW QUESTIONS

Participant #: _____

For purposes of this inquiry, the term 'body studies' refers to the broad range of research about, from and through the body, whether by focusing directly on or interacting directly with the body, its parts, processes, systems, etc., or by focusing on less direct aspects connected to the body, such as identity, creativity, behavior, transfer of knowledge, etc.

1. Does your field use metaphors related to the human body, its movement, dance, and/or choreography (etc.) in attempting to communicate complex relationships, or other aspects of your subject? *If YES:*

    a. What metaphor(s)?
    b. Why?
    c. What is it about this metaphor that is useful or relevant in this situation?

2. What kind of language does your field use to refer to:

    a. Embodied cognition / awareness / mindfulness / somatics / consciousness?
    b. Systemic health / ecology / dynamic balance / coherence?
    c. Disequilibrium / dissonance / dysfunction?
    d. Connection / embedment / relationship / wholeness?
    e. Disconnection / isolation / specialization / de-coupling / disassociation?

3. Is there any other language you use related to the human body, its movement, embodiment or immersed, experiential relationships?

4. What are some of the most important, significant, or key findings, developments, or new understandings ***about*** the living human body, its movement, parts of the body, embodiment or embodied cognition, in your field? (In other words, what does your field know ***about*** the human body, or its movement?)

5. What are some of the most important, significant, or key findings, developments, or new understandings ***from*** the living body, parts of the body, embodiment or embodied cognition in your field? (In other words, what does your field know ***from*** the body?)

6. What are the implications or ramifications from these findings, developments, or from these new understandings?

7. What questions do these findings, developments or new understandings raise?

8. What new or cutting edge areas of study do these developments open up or point to?

9. Have these developments changed how you perceive, experience, or relate to any part of your work?

    If YES, in what way(s)?

10. Have these developments changed how you perceive, experience, or relate to your body or its movement?

    If YES, in what way(s)?

11. Have these developments changed how you perceive, experience, or relate to any other part of your life?

    If YES, in what way(s)?

12. Can you imagine any information movement practitioners, artists and experts might bring to discussions that relate to or concern the human body, its movement or 'body studies'?

    If YES, what might some of your questions for these experts be?

13. In your broader discipline, what is seen as the most important challenge, inquiry, or research?

    Why?
    How is this challenge being addressed in your field?

    On a scale of 1 to 5, how would you rate the importance of this challenge?

	1	2	3	4	5
Importance:	None	Little	Some	Significant	Great

Missing in Action: Locating the Body in Interdisciplinary Studies

MOVEMENT PRACTITIONER INTERVIEW QUESTIONS

Participant #: _____

1. In recent years, science has begun to recognize that mind and body are inextricably interconnected. What affects or ramifications do you see this shift in understanding having:

    a. For your work in your field?
    b. For science?
    c. For humanity?
    d. For the planet?

2. What knowledge from your movement-based practice and/or experience do you think might be useful or important to other fields?

3. What skills and capabilities do you think you have developed because of your movement-based practice?

4. What skills and capabilities do you think you have developed because of your creative practice?

5. What key findings or developments in other fields have most affected your work, or your understanding of your work?

6. What key findings or developments in your field or discipline have most affected your work, or how others understand or value your work?

7. How do you think that we, as movement experts, can best contribute to the larger world (particularly in terms of systemic health)?

8. As a movement expert, have you tried to communicate across disciplines to 'speak' or educate on behalf of your field?

    If YES, what challenges have your encountered?

APPENDIX C

DETAILED DESCRIPTION OF INTERDISCIPLINARY PARTICIPANTS' FIELDS OF WORK

Interdisciplinary Participants' Fields of Work

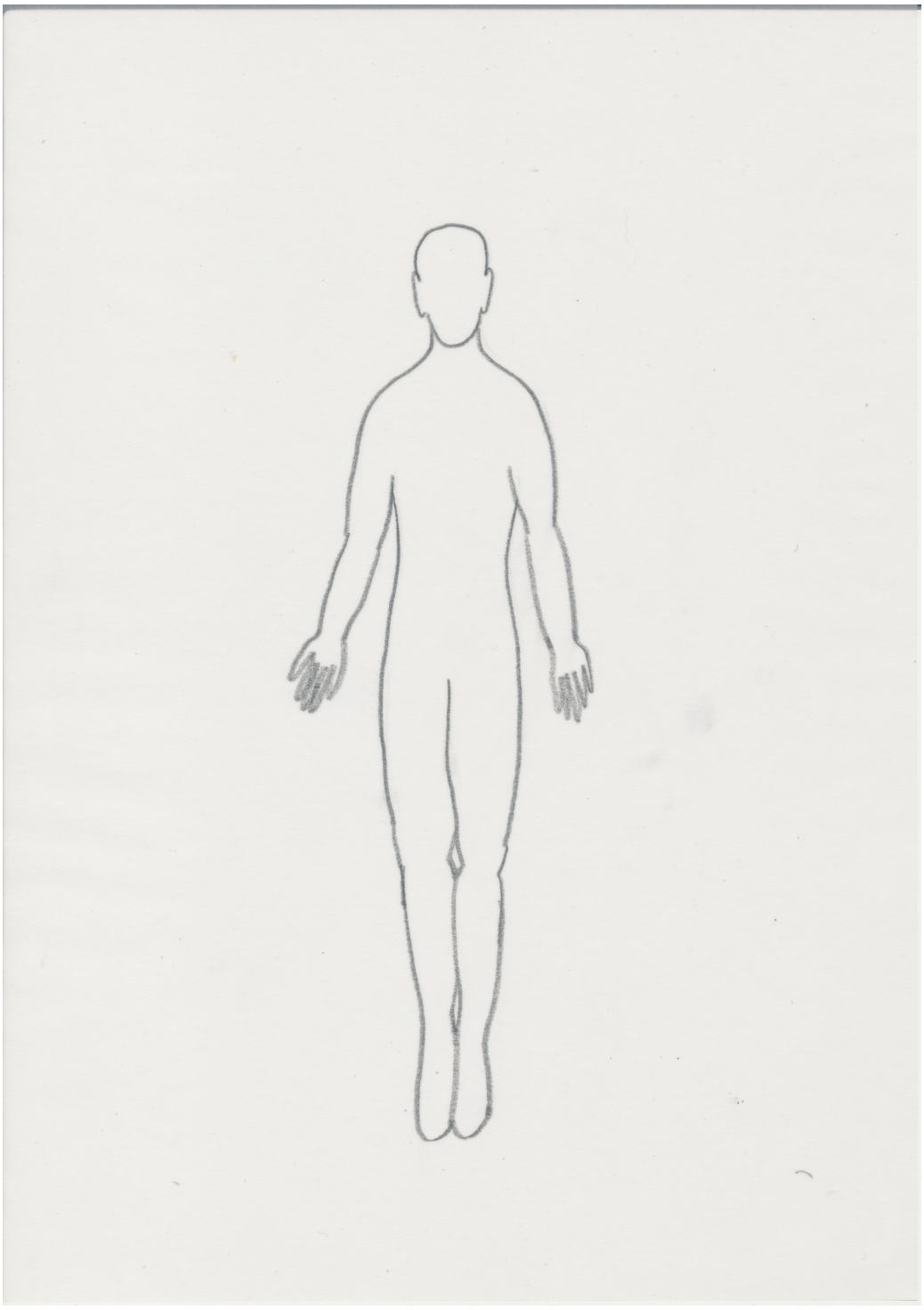
No. of Responses	Discipline
23	**Science & Technology** Neuroscience (9) Biology (5) Ecology/Environment (3) Computer Science (3) Technology (2) Engineering (1) Physics (0)
17	**Health & Wellbeing** Psychology (9) Medicine (7) Social Work (1)
17	**Cultural Studies** Philosophy (4) Literature (3) Anthropology (4) Religion & Spiritual Studies (3) Cultural Studies (1) Library & Museum Studies (1) Sociology (1)
16	**Art & Design** Performing Arts (4) Visual Art (6) Design (4) Architecture (2)
18	**Education**
7	**Business** Business (3) Communications, Media and Journalism (2) Economics (1) Geography (1)
1	**Other** Transportation (1)

APPENDIX D

BODY SCHEMA IMAGE AND EXAMPLES OF PARTICIPANTS' RESPONSES

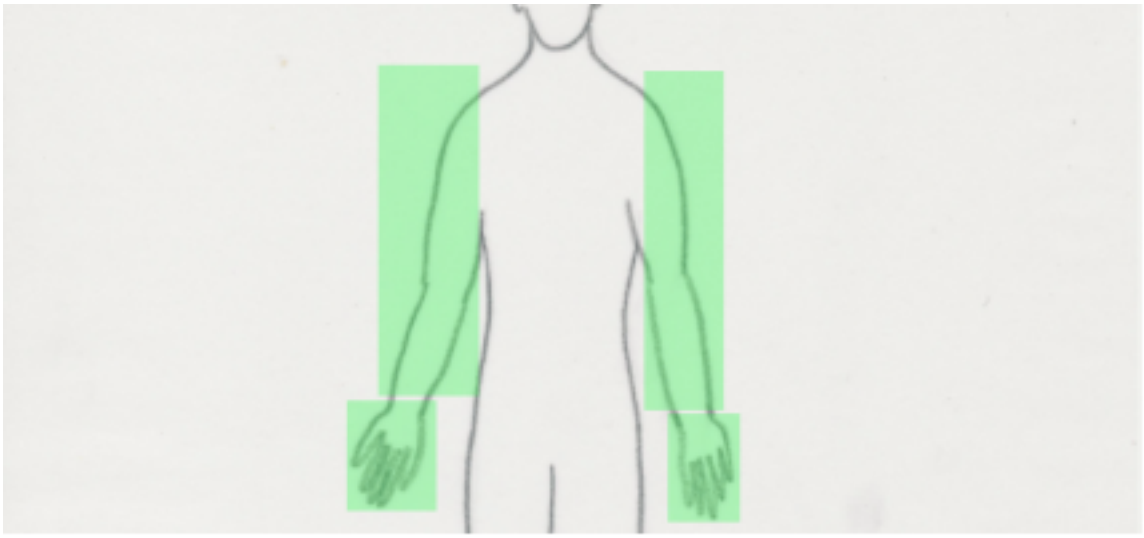
Body Schema:

"Using the image below to represent your body, use the cursor to highlight (or describe in the text box below) where you feel your mind resides?

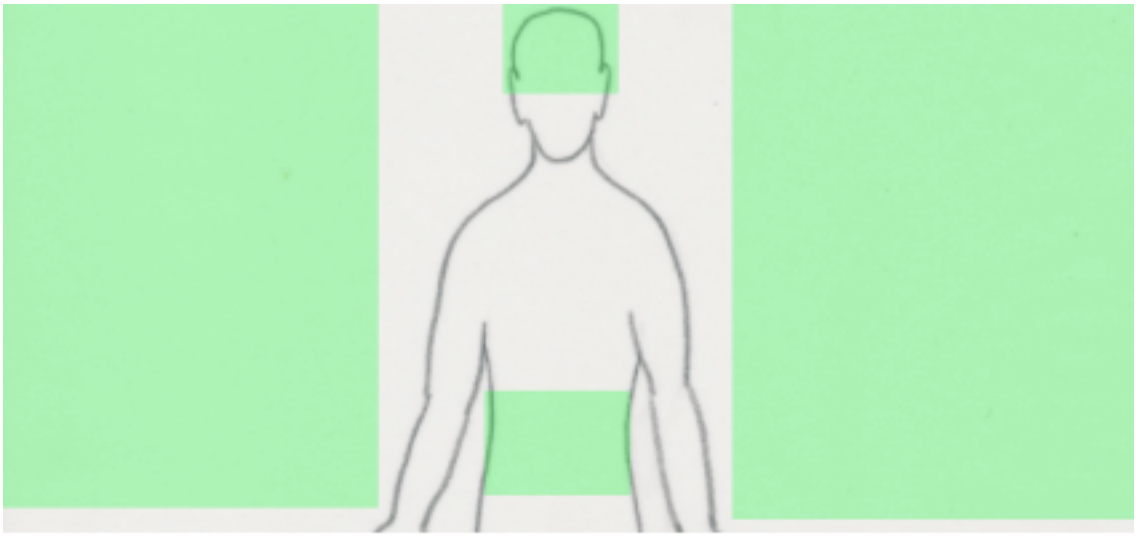


A few responses to this question (areas not shown were not highlighted):

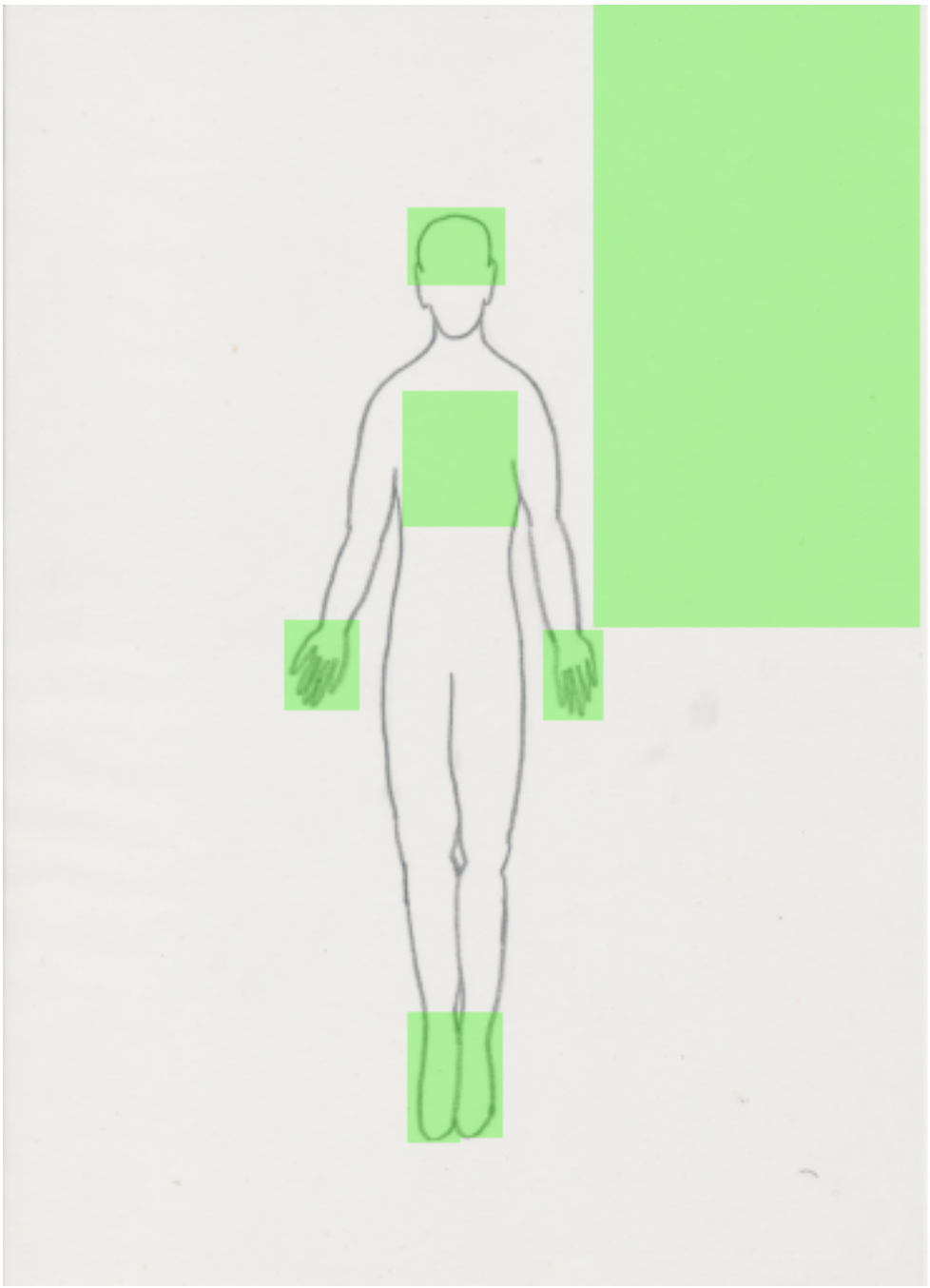
Example 1: Symmetrical body regions



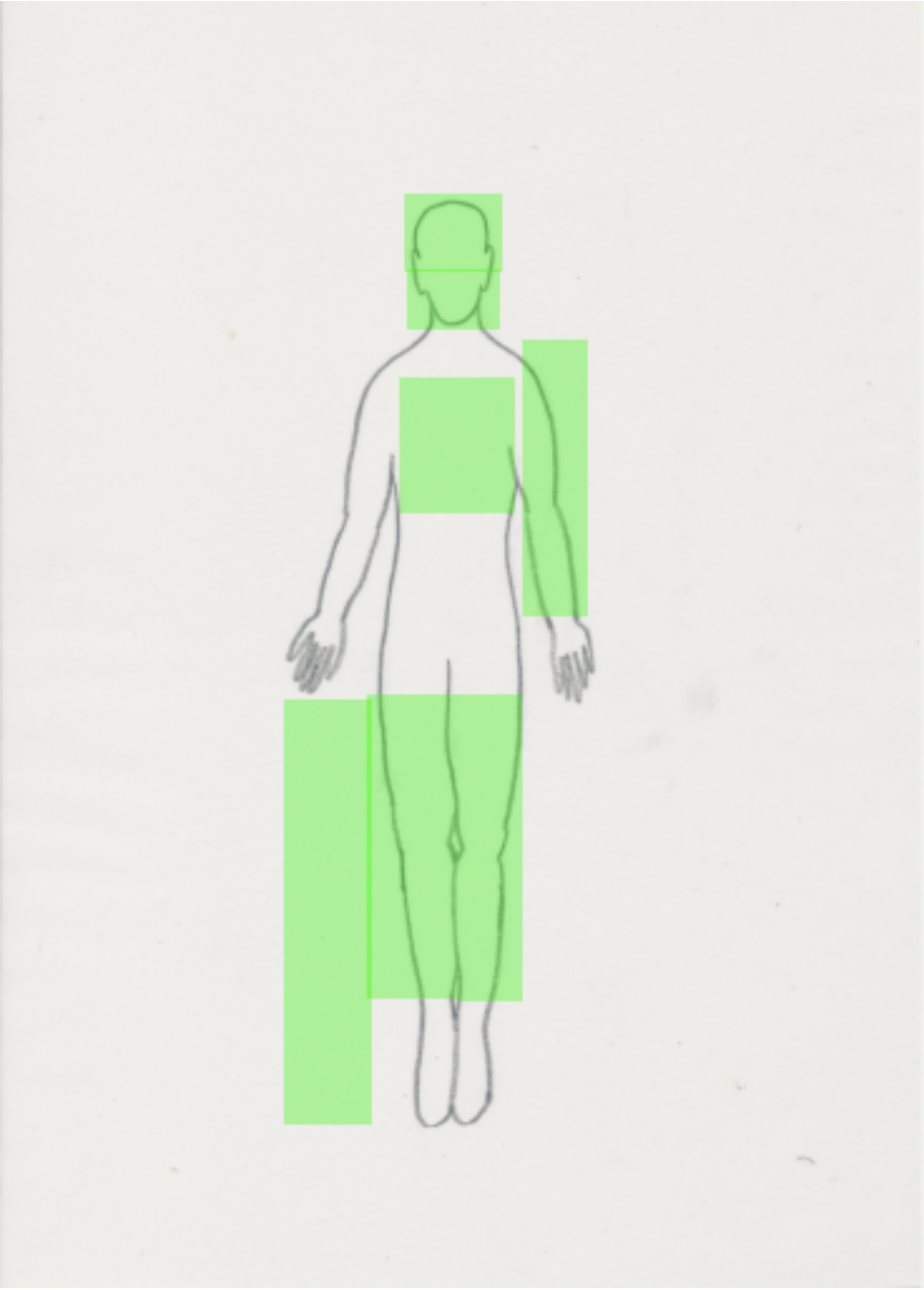
Example 2: Symmetrical body regions and spatial regions surrounding body



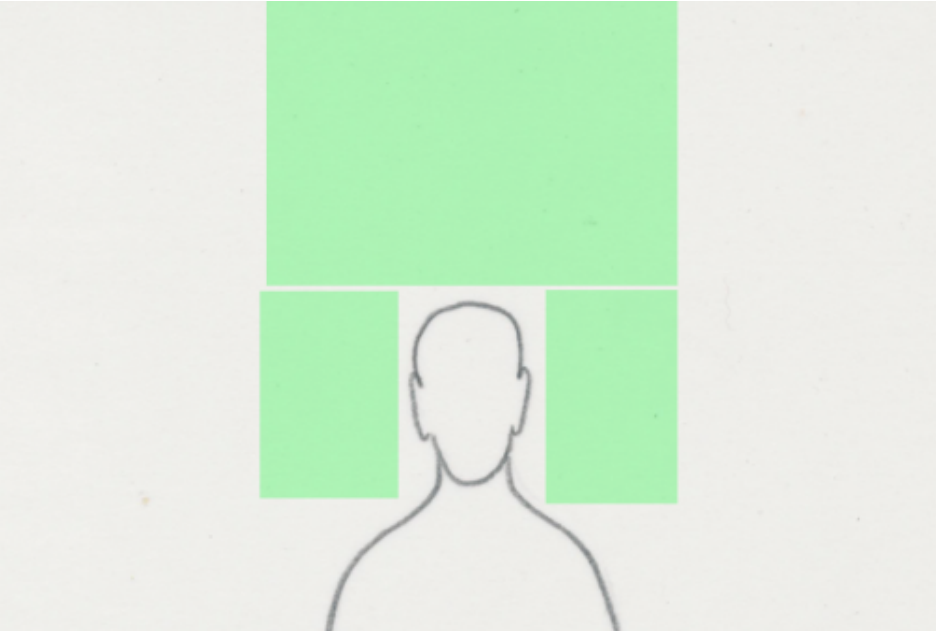
Example 3: Symmetrical body regions and asymmetrical spatial regions surrounding the body



Example 4: Asymmetrical body regions and spatial regions surrounding the body



Example 5: Spatial regions around the body, and no body



APPENDIX E

BODY-MIND-ENVIRONMENT SCHEMA, NINE ORIGINAL OPTIONS

Body-Mind-Environment Schema, Nine Original Options

Image 1

Image 2

Image 3

Image 4

Image 5

Image 6

Image 7

Image 8

Image 9

Image: Ann Moradian, 2019, based on 'Inclusion-of-Other-in-the-Self-Scale' from Aron 1992.

APPENDIX F

MOVEMENT EXPERT PARTICIPANTS' SELF-RATING OF SKILLS, ABILITIES AND CAPACITIES

Movement Expert Participants'
Self-Rating of Skills, Abilities and Capacities

On a scale of zero to five
5 = strong
0 = none

Enhanced Awareness

Self-rated Average Mean	**Type of Awareness**
4.68	Physical awareness
4.67	Awareness of bodies in space (incl. posture, kinesthesia, proprioception, effort, ease, qualities, textures, direction, level, weight (see gravity)
4.65	Spatial awareness (incl. proximity)
4.64	Sensorial awareness (incl. all of the senses, plus effort and ease, tactile sensitivity and awareness)
4.54	Internal awareness (incl. somatic and self-awareness)
4.40	Awareness of gravity (incl. graviception, awareness of weight, groundedness, relation to the earth, architectural and postural alignment in relation to the earth)
4.35	Awareness of dynamics in relationships
4.33	Awareness of the relations between viewer/viewed
4.29	'Environmental' awareness (natural environment, psycho-emotional, etc.)
4.24	Awareness of 'invisible' movement or subtle states of being (incl. presence, energy of history in a space, non-physical reality, permeability, energetics, spirit, collective unconscious, transitional v fixed states of being (such as liminality), movement in the mental body, casual awareness, spiritual awareness, cognitive v intuitive awareness)
4.20	Awareness of emotion in relationships
4.18	Contextual awareness
4.16	Layered attentional awareness
4.09	Temporal awareness (incl. rhythm and speed, applied in various ways)
4.06	Awareness of formal relationships (placement, shape, gesture)

Personal Skills, Capacities & Qualities

Self-Rated Average Mean	Type of Skill, Capacity or Quality
4.54	Willingness to learn
4.51	Reliability
4.48	Curiosity
4.47	Adaptability
4.45	Intuition
4.44	Integrity
4.34	Comfortable in front of an audience
4.34	Grit and determination (willpower)
4.31	Focus and concentration
4.31	'Resilience'
4.30	Compassion
4.24	Mental agility
4.24	Critical thinking
4.23	Solution orientation
4.21	Self-discipline or self-regulation
4.20	Ability to meet the unknown with relative ease or creative response
4.18	Ability to perform or stay focused under pressure
4.14	Comfortable with change
4.14	Courage
4.06	A positive attitude or outlook
4.01	Ability to manage one's own strong emotions (emotional stability)
3.99	Confidence
3.98	Comfortable making decisions
3.81	Ability to tolerate ambiguity and uncertainty

Interpersonal Skills & Abilities

Self-rated Average Mean	Type of Skill or Ability
4.40	Empathy
4.39	Nonverbal communication skills (both reading and expressing)
4.34	Ability to create or communicate meaning
4.33	Ability to motivate or inspire others
4.32	Ability to communicate comfortably with diverse types of people
4.30	Emotional intelligence
4.22	Physical empathy
4.17	Deep listening skills
4.12	Psycho-physical intelligence
4.02	Team building
3.95	Ability to respond constructively to others' strong emotions
3.72	Consensus building
3.57	Ability to respond constructively to inappropriate behavior
3.53	Conflict resolution
3.52	Negotiation skills

Creative Skills or Abilities

Self-rated Average Mean	Type of Skill or Ability
4.59	Ability to communicate or express through the body
4.56	Creativity or ingenuity
4.48	Imagination
4.43	Improvisational facility
4.39	Thinking 'outside the box'
4.38	Artistic expression
4.38	Ability to give constructive feedback
4.35	Use of imagery
4.31	Ability to decipher meaning, sense, order
4.22	Ability to design experience
4.20	Musicality
4.19	Abstract expression
4.17	Use of metaphor
4.11	Rhythmic coordination or organization
4.08	Ability to discern or predict possibility
4.03	Spatial design
4.00	Ability to receive criticism
3.97	Ability to convey a story
3.93	Design of dynamics
3.74	Temporal design
3.72	Formal design (shape)
3.69	Use of color
3.62	Organic design
3.57	Textural design

Organizational Skills & Abilities

Self-rated Average Mean	Type of Skill or Ability
4.45	Ability to meet deadlines successfully
4.07	Solution-oriented problem solving
4.06	Ability to identify root issues or problems
4.04	Goal orientation
3.97	Time management
3.96	Ability to prioritize
3.93	Ability to assess strengths and weaknesses
3.92	Event management
3.83	Production management
3.74	Process management
3.67	Multi-tasking
3.44	Ability to delegate responsibility
2.94	Marketing skill

Movement & Physical Skills

Self-Rated Average Mean	Type of Skill
4.51	Physical intelligence
4.37	Movement literacy
4.27	Physical articulation
4.23	Psycho-emotional health and wellbeing
4.22	Movement efficiency
4.22	Coordination
4.14	Cardio-vascular health
4.12	Movement precision
4.11	Overall physical health
4.07	Balance/steadiness
4.04	Strong immune system
3.98	Control
3.98	Physical agility
3.94	Strength
3.89	Flexibility
3.68	Stamina

APPENDIX G

MOVEMENT EXPERT PARTICIPANTS' COMPARISON OF TOP-RATED SKILLS AND ABILITIES

Skillset Group	Strong (4.5 and above)	Good (4.0 to 4.5)
Physical Skills and Abilities	Physical intelligence	Movement literacy Physical articulation Psycho-emotional health and well-being Movement efficiency Coordination Cardio-vascular health Movement precision Overall physical health Balance / steadiness Strong immune system
Creative Skills and Abilities	Ability to express/create thru the body Creativity or ingenuity	Imagination Improvisational facility Thinking 'outside the box' Artistic expression Ability to give constructive feedback Use of imagery Ability to decipher meaning, sense, order Ability to design experience Musicality Abstract expression Use of metaphor Rhythmic coordination or organization Ability to discern or predict possibility Spatial design Ability to receive (constructive) criticism
Personal Skills and Abilities	Willingness to learn Reliability	Curiosity Adaptability Intuition Integrity Comfortable in front of an audience Grit and determination Focus and concentration 'Resilience' Compassion Mental agility Critical thinking Solution orientation Self-discipline or self-regulation Ability to meet the unknown with relative ease or creative response Ability to perform or stay focused under pressure Comfortable with change Courage A positive attitude or outlook Emotional stability
Enhanced Awareness	Physical awareness Awareness of bodies in space Spatial awareness Sensorial awareness Internal awareness	Awareness of gravity Awareness of dynamics in relationships Awareness of the relations between viewer/viewed 'Environmental' awareness Awareness of invisible movement/ subtle states of being Awareness of emotion in relationships Contextual awareness Layered attentional awareness Temporal awareness Awareness of formal relationships
Interpersonal Skills		Empathy Nonverbal communication skills Ability to create or communicate meaning Ability to communicate comfortably w/ diverse types of people Emotional intelligence Physical empathy Deep listening skills Psycho-physical intelligence Team building
Organizational Skills		Ability to meet deadlines successfully Solution-oriented problem solving Ability to identify root issues or problems Goal orientation

On a scale of zero to five
5 = strong
0 = none
Highlight = Most valued by Movement Experts